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THE FLORA

OF THE

NILGIRI AND PULNEY HILL-TOPS

BY

P. F. FYSON, B.A., F.L.S.,

Professor of Botany, Presidency College, Madras.

With 580 full page illustrations and 4 maps

BY

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VOLUME I.

DESCRIPTIONS OF THE

WILD AND COMMONER INTRODUCED FLOWERING PLANTS

(ABOVE 6,500 FEET)

ROUND THE HILL-STATIONS OF

OOTACAMUND, KOTAGIRI AND KODAIKANAL

WITH FOUR MAPS.

VOLUME II.

ILLUSTRATIONS OF MANY OF THE PLANTS

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SUPPLEMENTARY TO VOLUMES I AND II INCLUDING THE COUNTRY ROUND

COONOOR

AND DOWN TO 5,000 FEET.

ILLUSTRATIONS

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MRS. FYSON

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1 7 1971

PREFACE.

THE first volumes of this work, published in 1915, were accorded so warm a reception that it has been thought worthwhile issuing a supplementary volume to describe and illustrate plants not included in them, and also other species which grow as the fringe of the plateaus. For it was intended in volume I to consider only the special flora of the true plateaus, a collection of species entirely different from those of the lower slopes and the plains and which may be described as that of tropical highlands. But a rigid selection of those only which were definitely known to me at the time to occur in this limited area led to the exclusion of several which really belong to it, and in addition it seemed worthwhile (abandoning the restriction to a tropical highland flora) to include those ordinarily found by residents on these hills, and especially round Coonoor. In the present volume therefore the area taken has been widened to include the upper levels of the slopes, and at the same time figures are shown of a number of species previously described but not illustrated. Botanically speaking the most important additions and revisions in the first-half of the letterpress are due to the publication within the last three years of the first instalments of a new Flora of the Madras Presidency by G. S. Gamble, F.L.S., late of the Forest Service. This work, so far as any.thing may be considered authoritative in science, will when completed be *the* authoritative Flora of this Presidency, and all botanists in South India are indebted to the author for this long-overdue and very necessary revision of our Flowering Plants, and for the careful work that has been

put into it. In the present volume the names of several species and even genera have been revised in accordance with the new Flora, and some species included which are shown by Gamble to occur here, though so far not collected by me: such revisions and additions being acknowledged in the text by reference to *Gamble's Flora of the Madras Presidency* or more shortly *G.F.M.P.* But the parts so far published of this Flora extend only to the ARALIACEÆ, and it is only to be expected that in subsequent parts many more species and revisions will be shown to apply to our area. No guarantee therefore is implied that all the species have been dealt with, and indeed it is hardly possible in a work of this kind ever to attain finality. For the majority of my readers the value of the work probably consists in the illustrations to the first set of which Lady Bourne contributed so large a share. In the present volume most of the illustrations have been drawn by my wife, Mrs. Harison contributes one, Mrs. E. W. Stoney four, Mr. Gordon Robertson eleven, two unfinished drawings of the Indian artist R. Natesan are now included and the sedges and grasses are mainly by myself. To avoid confusion the plates are numbered consecutively on those of volume II. I also gratefully acknowledge help in the identification of indigenous species, by Rai Bahadur K. Ranga Achariyar and Mr. C. Tadulingam of the Agricultural Research Institute, Coimbatore; and of introduced plants by Messrs. C. C. Calder and V. Narayanaswami of the Botanical Survey of India, Calcutta; and Sir David Prain, C.M.G., F.R.S., and the staff of the Herbarium at Kew. That the work falls far short of perfection I am only too keenly conscious, but I am in hopes that this illustrated account of the flowering plants will be of interest and use to residents and visitors of these hill stations and the adjoining Planting districts.

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NOTE ON BOTANICAL NOMENCLATURE.

It may perhaps be of interest to some users of this book, and may make the changes in the names of plants which are shown in this volume appear more reasonable, if I briefly explain the principles underlying the scientific naming of plants. Every kind, or species, of plant or animal is known by a double name, the second being the special or individual name of the species and the first that of the group or genus to which the species obviously belongs. This system was introduced by Linnaeus in the 18th century, and fits in so well with the natural relationships of the varied forms of life that it has been universally adopted. Its usefulness is unquestioned.

The second, species name, is always that given to it by the man who first scientifically described the species, i.e., 'founded' it, and is in general unalterable. The only valid reason for changing the name of a species is the discovery that the name had already been given to another species of the same genus, or that the supposed new species is not really distinct from an older-named species. For the first reason the South Indian Asparagus subulatus *Steudel* has had to be changed to Asparagus Fysoni *MacBride* (p. 116) and for the second Derris oblonga has been 'reduced' to Derris canarensis (p. 39 . The decision on second of these reasons must necessarily be to some extent a matter of opinion, as also sometimes whether a certain plant does really belong to a pre-existing species (perhaps as a 'variety') or should be considered distinct. The tendency at the present time is to split off varieties or distinct species. (See the species of the Sect. *Alatæ* of CROTALARIA in vol. I, p. 102 et seq.).

The first of the names is the genus to which the species belongs. It also is the name first scientifically given to that genus. The same rules apply as with species. Thus ZEHNERIA (of the F.B.I. I) was merged in (reduced to) MELOTHRIA, a few years ago, and MUKIA is now following suit (see p. 54). BRASSAIA, a genus founded by Clarke, is now judged to be not really distinct from HEPTAPLEURUM, and the latter name has had to give way to the earlier SCHEFFLERA. Sometimes, on the other hand, a genus—formed perhaps by the amalgamation in this way of several—becomes so large that it is convenient to split it up again. For this reason ANDROPOGON has been divided into seven or eight genera (see vol. I, p. 455) and now EUGENIA also into smaller genera, of which one genus belong to SYZYGIUM (p. 47).

Very occasionally the merging of one genus in another means that the name of a species must be changed too, so as to avoid having two of the same name in the genus (vol I, p. 246) or the converse may happen, and on account of a change in the genus the species name previously 'reduced' may now be restored: but both these changes are rare.

After the two names it is customary to add the name of the author of the combination, so as to obviate confusion between the plant meant and another to which the same names have perhaps been given in ignorance or error by a later botanist.

It will thus be seen that however much we may sometimes be inclined to deplore the passing away of some well-established name like VISCUM, or the use of an ugly one like SYZYGIUM, changes are made only when necessitated either by historical research or by a change of view brought about by fresh discoveries: and though these due to purely historical reasons must become fewer and fewer till in time they finally cease to appear. So long as the science is a living one there must always be new discoveries and new points of view. The systematic naming of plants can no more be fixed than any other branch of science.

KEY TO THE FAMILIES AND CERTAIN ABNORMAL GENERA.

1 — Flowers in compact heads backed by an involucre of green bracts 2
Flowers solitary or variously arranged, if in a head with no involucre of separable bracts below 3

2 — Heads white or grey on leafless stalks rising from a group of narrow radical leaves. Flowers minute. (Hatpin flower) . . . . *p.* 427. ERIOCAULON.
Anthers united round the style. No calyx. (Sunflower, etc.) . . . . *p.* 205. COMPOSITÆ.
Anthers free attached at various heights to the inside of the slender perianth. Heads very densely woolly. *p.* 350. LASIOSIPHON.
Anthers free on slender filaments. Leaves opposite. *p.* 204. DIPSACUS.

3 — Flowers small in spikelets. (Grasses and Sedges) . . .
Flowers minute, without sepals or petals 60
A perianth round each flower 4

4 — Perianth inconspicuous, of one whorl not distinguishable as petals and sepals, greenish or brownish . . . 54
Perianth conspicuous, usually of white or coloured petals and green sepals . . . . , ... 5

5 — Sepals or petals two, four or five; petals quite free at the base 7
Sepals or petals two, four or five; petals united at least at the base 34
Sepals and petals three, all alike or sepals less coloured, or one petal or sepal larger or spurred 61
Sepals five, petals three 6

6 — Flowers minute in large panicles: fruit ¼ inch, drupe. (Spiræa tree) . . . . . . Vol. I *p.* 91. MELIOSMA.
Lowest petal boat-shaped, fringed . . . . Vol. I *p.* 26. POLYGALA.

7 — Ovary or carpels, superior, i.e., inserted above the base of the inferior petals and stamens 8
Ovary inferior, usually sunk in the end of the flower-stalk below the sepals 28
Ovary at the bottom of but not enclosed in the calyx: petals and stamens arising above it. *p.* 52. LYTHRACEÆ.

8 Style unbranched or stigmas without style, on an ovary of one or more cells 9
Styles three to five, or branched ovary of one or more cells 16
Ovary of several distinct carpels each with its short style 29

9 Ovary and fruit of one cell only 10
Ovary and fruit of two to five cells 18

10 Stamens five only : flowers regular or nearly so . . 11
Stamens seven to ten or many free or united : Seed attached to one edge only of the pod. . . *p.* 29. LEGUMINOSEÆ.
Stamens many : fruit fleshy with many seeds . . . . . *p.* 5. SCOLOPIA.

11 Trees : fruit more or less fleshy 12
Trees : fruit a five-valved capsule : leaves large pinnate. *p.* 22. CEDRELA.
Herbs : fruit dry 14

12 Seed one only 13
Fruit ½ in., orange ; pulp sticky : style ¼ in . . . . . . *p.* 6. PITTOSPORUM.
Fruit 1½—3 in., brown ; no pulp ; a narrow scale against each petal. . . . . *p.* 6. HYDNOCARPUS.

13 Flr. in tall panicles : ls. simple hard, or pinnate. . .*p.* 29. "Spiræa—tree". . . . . *p.* 29. SABIACEÆ.
Flr. in flat corymbs, evil smelling : leaves simple, broad, soft. . . . . *p.* 24. MAPPIA.
Flr. solitary or few lateral. . . . *p.* 23. GOMPHANDRA.

14 Fruit a two-valved capsule : leaves pinnate . . . . . . *p.* 22. HEYNEA.
Fruit dry or fleshy, indehiscent 16

15 One petal spurred : fruit three-valved . . . *p.* 5. VIOLA.
Petals fringed : fruit opening at the top. . . . . *p.* 4. RESEDA.

16 Marsh herbs with opposite leaves and pink flowers . . . *p.* 52. ROTALA.
Trees and thorny climbers with scented gland-dotted leaves. *p.* 20. RUTACEÆ.
Herbs, shrubs, trees and climbers. . . . .

17 Petals four ; stamens six ; capsule two-celled. Herbs. 18
Petals four or five ; stamens same number 19
Petals five ; stamens eight ; leaves three-foliate. Tree. . *p.* 28. ALLOPHYLUS.
Petals five ; stamens numerous : trees or herbs . . 22

18 Sepals two, petals unequal : leaves delicate, much divided. *p.* 3. FUMARIACEÆ.
Sepals four, petals equal . . . . . . *p.* 4. CRUCIFERÆ.

19 { Stamens opposite the petals 20
Stamens alternate with the petals 21

20 { Tendril climber; leaves simple or compound. . . . . *p.* 27. VITACEÆ.
Trees, shrubs, or stragglers, often thorny . . . . *p.* 25. RHAMNACEÆ.

21 { Leaflets five to seven: disc in flower a crenulate cup . . *p.* 29. TURPINIA.
Ls. simple, glossy: flowers white; fruit fleshy small. . . *p.* 24. ILEX.
Ls. simple: flowers green or brownish: fruit a capsule; seed with coloured skin or aril. . *p.* 24. CELASTRACEÆ.

22 { Petals deeply cut: fruit drupe. . . *p.* 12. ELÆOCARPUS.
Petals entire: buds usually large. . . . . *p.* 10. TERNSTRŒMIACEÆ.
Petals small, yellow: capsule very spiny. . . . . . . *p.* 12. TRIUMFETTA.
Petals small or white: trees. . . . . *p.* 41. ROSACEÆ.

23 { Leaves opposite: buds large; fruit with yellow juice. *p.* 9. GARCINIA.
Leaves alternate 28

24 { Ovary one-celled 25
Ovary of several cells or carpels 27

25 { Seed solitary: stipules tabular encircling the stem at each node. Leaves alternate . . . *p.* 338. POLYGONACEÆ.
Seeds several on a central placenta. Herbs with opposite leaves and swollen nodes . . *p.* 6. CARYOPHYLLACEÆ.
Seeds several, on the walls of the ovary 26

26 { Climber with axillary tendrils: stamens and style raised on a central column . . . . *p.* 163. PASSIFLORA.
Slender trailing herb with opposite gland-dotted leaves: flower yellow: stamens many . . . *p.* 8. HYPERICUM.
Herb with very sticky often red leaves: flower white: stamens five. In damp ground . . *p.* 145. DROSERA.

27 { Stamens five only, opposite the petals 28
Stamens five, outside a crenulate disc: fruit three-celled: leaves pinnate. Tree . . . . . . *p.* 29. TURPINIA.
Stamens ten or five and five staminodes: petals twisted in bud. Fruit five-celled 29
Stamens five, opposite the sepals. Leaves covered with sticky hairs . . . . *p.* 145. DROSERA.
Stamens many united or free 30

28 { Climbers with tendrils opposite the leaves . *p.* 27. VITACEÆ.
Trees or shrubs: fruit with one or more stones . . . . *p.* 25. RHAMNACEÆ.

29
- Fruit splitting into five, long-tailed, one-seeded carpels. . Vol. 1 *p.* 31. GERANIACEÆ.
- Fruit splitting into five, two-seeded or ten, one-seeded parts: leaves entire . . . . . Vol. 1 *p.* 50. LINUM.
- Fruit opening along five lines, the carpels not separating from each other . . Vol. 1 *p.* 54 & *p.* 13. OXALIDEÆ.

30
- Carpels quite distinct 31
- Ovary of three to ten cells 32

31
- Trees: branches ringed at each leaf: flowers 2 to 3 inches across: fruiting carpels ½ inch a spike of 3 to 5 inches. Vol. 1 *p.* 9. MAGNOLIACEÆ.
- Herbs: no epicalyx below the spls. *p.* 1. RANUNCULACEÆ.
- Prickly shrubs or if herbs then with five bracteoles immediately below the sepals. . . . . . . *p.* 41. ROSACEÆ.

32
- Trees: leaves finally serrate: flowers ⅙ inch in small subsessile bunches . . . . . Vol. 1 *p.* 41. EURYA.
- Herbs: leaves divided or lobed: flowers ½ to 2 inches: anthers numerous kidney-shaped . *p.* 10. MALVACEÆ.
- Herbs and shrubs with opposite gland-dotted leaves. . . *p.* 8. HYPERICUM.

Polypetals with inferior ovary.

33
- Parts of flower in twos or fours. Stamens as many or twice, straight. Herbs 34
- Petals four to five; anthers eight to ten, large or small horned at the base or filament bent. *p.* 47. MELASTOMACEÆ.
- Petals five or six, stamens as many 35
- Stamens numerous 36

34
- Herbs with small opposite leaves and pink flowers in leafy spikes. In damp places . . . . . *p.* 159. AMMANNIA.
- Herb with alternate heart-shaped leaves and solitary white flowers. In damp places. . . . . . *p.* 44. PARNASSIA.
- Strongly smelling plants with small umbelled flowers. 34*

34*
- Shrubs or trees: leaves large palmate. *p.* 177. ARALIACEÆ.
- Herbs: leaves entire or much divided: fruit separating into two halves . . . . . . *p.* 167. UMBELLIFERÆ.

35
- Flowers unisexual, small. In marshes. *p.* 147. SERPICULA.
- Land plants; flowers small or large . . *p.* 160. ONAGRACEÆ.

36
- Leaves entire, scented, opposite except in *Eucalyptus*: stamens curled inwards in bud . *p.* 147. MYRTACEÆ.
- Leaves alternate toothed, simple or not. *p.* 129. ROSACEÆ.
- Sepals and petals two, ovary three-winged. *p.* 55. BEGONIA.

Monopetals.

37 Ovary or carpels superior 43
Ovary inferior : fruit crowned by the dried calyx or its scar 38

Monopetals with inferior ovary.

38 Shrubs parasitic on other trees : seed very sticky, anthers five, slender . . . . *p.* 352. LORANTHACEÆ.
Herbs, shrubs or trees rooting in the ground . . . 41

39 Leaves alternate 40
Leaves opposite . . (*See also* 2) 42

40 Fruit one-seeded : trees with many stamens : leaves usually toothed. . . . . *p.* 271. SYMPLOCOS.
Fruit with many seeds 41

41 Stigma unbranched : stamens ten, opening by holes, horned : tree or shrub . . . . *p.* 257. VACCINIACEÆ.
Stigmas three, climber, leaves angular rough : stamens three, S-shaped, or five straight . *p.* 165. CUCURBITACEÆ.
Herbs, small or tall : stigmas two or three : flowers bell-shaped or two-lipped . . . . *p.* 253. CAMPANULACEÆ.

42 Stamens three : fruit with feathery hairs. Herbs . . . *p.* 202. VALERIANACEÆ.
Stamens four or five : leaf-stalks at least when young connected by united stipules. . . . . *p.* 185. RUBIACEÆ.
Stamens five : leaves of a pair connected by a line only, no stipules. . . . . *p.* 180. CAPRIFOLIACEÆ.

Monopetals with superior ovary.

43 Stamens united round and to the stigma : carpels and styles inside two, distinct ; fruit of two follicles : leaves opposite . . . . *p.* 281. ASCLEPIADACEÆ.
Stamens distinct 44

44 Stamens five equal in number to the corolla lobes . . 46
Stamens eight or ten 45
Stamens four or two usually fewer than the corolla lobes. 49

45 Stamens eight : succulent herbs with thick leaves, and yellow, four-petalled flowers . . *p.* 141. CRASSULACEÆ.
Stamens ten : anthers opening by terminal pores : leaves hard . . . . *p.* 259. ERICACEÆ
Stamens eight or five and five staminodes. trees . . . *p.* 76. SAPOTACEÆ.

46 Stamens on the corolla, opposite its lobes : ovary one-celled 47
Stamens between the corolla lobes 48

47 Herbs : flowers yellow or pink : seeds many on central placentum . . . . *p.* 262. PRIMULACEÆ
Trees or shrubs : seed one only . . *p.* 75. MYRSINEÆ.

48 { Leaves radical: flowers in a spike terminating a leafless stem: capsule opening across . . . *p.* 336. PLANTAGO.
Leaves alternate at least the lower 49
All leaves opposite 50

49 { Twining plants: corolla folded inwards and twisted in bud . . . . *p.* 293. CONVOLVULACEÆ.
Erect rough herb: flowers in a double row, on one side of a curled spike . . . . *p.* 292. BORAGINACEÆ.
Upper leaves often in unequal pairs: ovary not divided to the top: seeds flat . . . . . . *p.* 295. SOLANACEÆ.
Submerged or marsh plant: flowers small unisexual . . . *p.* 147. SERPICULA.

50 { Shrub with milky juice: corolla twisted in bud . . . . *p.* 78. APOCYNACEÆ.
Climber or tree, no milky juice . . *p.* 81. LOGANIACEÆ.
Erect herbs: leaves three to seven-nerved: capsule incompletely two-celled . . . . . . *p.* 288. GENTIANACEÆ.

51 { Leaves opposite 52
Leaves radical: or upper at least alternate 55

52 { Corolla regular, twisted or valvate in bud, stamens two: fruit fleshy . . . . *p.* 274. OLEACEÆ.
Corolla-lobes imbricate in bud 53

53 { Fruit of four (dry) nutlets: flowers usually in dense whorls: scented herbs . . . . . . *p.* 321. LABIATÆ.
Fruit fleshy or of two parts: flowers in spikes or open panicles . . . . *p.* 318. VERBENACEÆ.
Fruit a capsule with few or many seeds 54

54 { Nodes swollen: bracts in spike conspicuous: capsule oblong: seeds on springy-stalks . *p.* 310. ACANTHACEÆ.
Capsule long and slender: leaves thick. *p.* 308. ÆSCHYNANTHUS.
Capsule short 55

55 { Small marsh plants with submerged, finely divided leaves, often bearing bladders: flowers few with sharp spur . . *p.* 306. UTRICULARIA.
Green plants: capsule globose or oblong: seeds not on hard stalks: bracts not conspicuous 56
White or coloured plants: no real leaves. OROBRANCHACEÆ.

56 { Ovary and capsule completely divided . . . . *p.* 87. SCROPHULARIACEÆ.
Capsule one-celled, the seeds on large placentas intruded from the walls . . . . *p.* 91. GESNERACEÆ.

Petal-less flowers.

(The following are a mixed lot, containing families with only one perianth whorl and petal-less genera and species from

families which have normally complete flowers. For flowers with conspicuous coloured sepals but no petals see Nos. 2 and 8.)

57 ‘Flower’ apparently consisting of a four or five-lobed cup enclosing numerous stamens (male flowers), and a solitary stalked, three-lobed ovary (female flower). Herbs with milky juice . . . . *p.* 360. EUPHORBIA.
Flowers unisexual in a short thick spike with bracts below: male perianth red, lobed ½ inch: stamens united; female without perianth. Thick warty leafless plant parasitic on the roots of trees . . *p.* 358. BALANOPHORA.
Stamens one to five, as many as the sepals or fewer . 58
Stamens five to twelve 62
Stamens numerous 63

58 Ovary inferior 59
Ovary superior: stamens opposite the sepals one seed only 60

59 Trailing plant with long stalked, round-lobes, leaves folded fanwise . . . . *p.* 137. ALCHEMILLA.
Shrub often straggling or spiny: all parts covered with flat glistening scales . . . . *p.* 351. ELÆAGNUS.
Shrub or herb: no glistening scales . *p.* 357. SANTALACEÆ.
Marsh or water plants . . . . *p.* 45. HALORRHAGIDACEÆ.

60 Ovary one-celled. Flrs. unisexual 61
Capsule three or ten-celled: trees . . *p.* 105. EUPHORBIA.

61 Trees with unisexual flowers and fleshy drupe . . . . *p.* 106. DAPHNIPHYLLUM.
Herbs with spiny deflexed flrs. . . . *p.* 98. AMARANTACEÆ.
Herb, shrub or tree: ovary one-celled. *p.* 366. URTICACEÆ.

62 Stamens twelve, fruit 1 inch, transversely two-lobed: leaves entire. A tree . . . . *p.* 130. PYGEUM.
Stamens ten, attached at various heights inside the tubular perianth. A small tree (see 2) . *p.* 350. THYMELACEÆ.
Tree: stamens united at the base: seeds many with coloured aril: flowers fascicled . *p.* 162. SAMYDACEÆ.
Herb or shrub: stipules or tubes encircling the stem at each node: seed solitary erect . *p.* 338. POLYGONACEÆ.
Shrub: flowers often unisexual: anthers large: fruit three-winged capsule . . . . *p.* 88. DODONÆA.

63 Herb with much divided leaves: carpels many separate. *p.* 4. THALICTRUM.
Trees: leaves entire: flower unisexual: fruit a drupe or dry . . . . *p.* 359. EUPHORBIACEÆ.
Tree: female flower surrounded at the base by imbricating scales, which in fruit form a cup holding the nut (acorn) oak . . . . *p.* 377. QUERCUS.
Shrub: carpels in fruit fleshy, each with one seed . . . *p.* 337. PHYTOLACCA.

64 Flowers in a thick spike enclosed in a spathe: leaves large radical . . . . *p.* 424. ARACEÆ.
Flowers in slender spikes: climbers with alternate three-nerved leaves or epiphytes with leaves in fours . . . *p.* 342. PIPERACEÆ.
Flower consisting of two or more stamens and an ovary only in the axil of a small bract, arranged in spikes. Trees with alternate, stipulate, toothed leaves (Willow) *p.* 377. SALIX.
Flowers aggregated in flat or hollow, fleshy involucres . . *p.* 366. URTICACEÆ.

Sepals three, petals three, stamens usually three or six.

65 Stamens and style united into one column: one petal (usually the front one) larger often spurred or saccate: seeds minute. Perennial herbs, on the ground or on trees . . . . *p.* 379. ORCHIDACEÆ.
Anthers five, connected round the stigma, but free of it: hind petal hooded, two front petals bifid: front sepal spurred or saccate. Herbs, all on the ground . . . . *p.* 59. BALSAMINEÆ.
Other herbs, shrubs and trees 62

THE FLORA OF THE NILGIRI AND PULNEY HILL-TOPS.

RANUNCULACEÆ.

CLEMATIS.

See Vol. I p. 1.

KEY TO THE SPECIES.

a { Flowers ¼ inch, numerous . . . . C. gouriana.
Flowers over 1 inch, few, filaments of stamens glabrous . b
Flowers over 1 inch, filaments hairy (Vol. II t. 1) . . . C. wightiana.

b { Sepals glabrous at length inside, connective of stamens much produced beyond the anthers (Vol. I p. 3) . . . C. munroana.
Sepals tomentose inside when mature, filaments produced little . . . . C. theobromina.

Clematis gouriana *Roxb.*; *F.B.I.* i 4, I 9. Glabrous or nearly so. Leaves pinnate or bi-pinnate, of three or more leaflets. Leaflets ovate or ovate-lanceolate, acute, usually entire but sometimes toothed, glabrous, glossy or not on the upperside, with 3 or 5 main basal nerves and prominently raised recticulate venation on the under. Flowers small, white, in axillary and terminal panicles. Sepals ¼ to ⅓ inch, pubescent on the outside and slightly so on the inside. Filaments glabrous, not contracted below the anthers. Carpels in fruit with pure white hairy tail at first ¼ inch only, lengthening to 1½ or 2 inches. Wt. Ic. tt. 933, 934.

Nilgiris: below Coonoor. *Fyson* 299. *Bourne* 1552.

Gen. Dist. Western Himalaya to Ceylon, Java and the Philippines. This species closely resembles C. vitalba, Travellers' Joy of England.

Clematis theobromina *Dunn*; *Kew Bull.*, 1914, p. 181. A tall climbing shrub, glabrous except in the flowers,

ARNOLD
ARBORETUM
HARVARD

Leaves three-foliate or the uppermost simple; leaflets ovate 2½ to 5 inches long, entire acute or acuminate, with obtuse or cordate base, and 5 to 9 basal nerves; petiole a little shorter. Flowers 1½ to 2 inches diameter, solitary in the axils or terminal, on stalks of 3 to 4 inches with a pair of broad bracteoles near the base. Sepals 4 to 6, obtuse, tomentose on both sides, red inside, brown outside. Filaments of stamens as broad as the anthers, which are twisted spirally after dehiscence; connective hardly produced. Achenes ovoid with a long feathery tail.

Nilgiris: Coonoor, etc., Neduvattam. Flowers March to September.

The above is taken from Dunn's Latin description in the Kew Bulletin. The species is very like both C. smilacifolia and C. munroana in which however the leaves are mostly or all simple, the sepals glabrous inside, and the connective of the stamens distinctly produced beyond the anthers. The former species has dark purple erect flowers, the latter white nodding ones. Both seems to occur at lower levels.

MENISPERMACEÆ.

See Vol. I p. 11.

KEY TO MALE SPECIMENS

a { Stamens connate in a terminal ring or head (Vol. II t. 9). b
  { Stas. free, flrs. in 1 foot drooping panicles . DIPLOCLISIA.

b { Flowers in umbelled heads (Vol. II t. 9) . . STEPHANIA.
  { Flrs. panicled, petals connate, calyx campanulate . CYCLEA.

KEY TO FEMALE SPECIMENS.

a { Ovary of one carpel only . . . . b
  { Carpels 3 or more, drupes sessile on the pedicel; flowers in 1 foot drooping panicles . . . . . . DIPLOCLISIA.

b { Flowers in panicles . . . . CYCLEA.
  { Flrs. in umbellate heads (Vol. I p. 12, and II t. 9) . . . STEPHANIA.

DIPLOCLISIA.

Climbing plants with large drooping panicles, free stamens, globose anthers, a curved ovate seed, and cotyledons lying close against each other.

Species about 5 only, in tropical Himalaya and here.

Closely allied to COCCULUS (*F.B.I.* 5 X) but separated because of the drooping panicles and the centre of the endocarp reduced to a thin flat septum.

Diploclisia glaucescens *Diels.*; *F.B.I.* as Cocculus macrocarpus *W. & A.*, i 101, X 1. A large climber, leaves round or broader than long, 5-nerved, glaucous beneath, 2 to 4 inches across, shorter than their petioles; flowers yellow; drupes reddish, obovoid 1 in. long.

Nilgiris and Pulneys in forests, up to 6,000 feet. [*G.F. M.P.*]

Gen. Dist. Western Ghats.

FUMARIACEÆ.

Herbs with usually delicate much divided leaves and the parts of the flower in twos. Sepals 2. Petals 4 in two dissimilar pairs, one or both of the outer pair swollen or spurred at the base, the inner pair smaller and usually coherent at the tips. Stamens 6, in two bundles opposite the outer petals the middle anther 2-celled, the outer 1-celled. Ovary 1-celled, but of 2 carpels; fruit a 1-seeded and indehiscent or a many-seeded capsule.

Species about 150, in the temperate and warm regions of the N. Hemisphere.

Common European weeds which may at any time appear on these hills are various species of FUMARIA (Fumitory) and CORYDALIS.

Species of DICENTRA (DIELYTRA) especially D. spectabilis are cultivated in gardens.

CORYDALIS. F.B.I. 9 III.

Herbs with the characters given above but one outer petal only spurred and capsule many-seeded.

Species about 80, mostly in temp. Europe and Asia.

FUMARIA is very similar, but the flowers are usually pinkish not yellow, and the capsule only 1-seeded.

Corydalis lutea *DC.* A small herb of 6 to 15 inches. Leaves delicate, much divided into narrowly oblong segments of different lengths. Flower yellow, about ½ inch, in short racemes; spur a roundish sac. Fruit a pod, ¼ to ⅓ inch long with several seeds.

Nilgiris: as a weed in gardens, etc. *Fyson* 3861.

Gen. Dist. Southern Europe, in stony places.

CRUCIFERÆ.

See Vol. I p. 15, and add:

NASTURTIUM. F.B.I. 10 V.

Similar to CARDAMINE (Vol. I p. 17) but pods cylindrical not flat, and seeds globose in two rows.

Species 2 or 3, in temperate and tropical countries.

Nasturtium officinale *Br.*; *F.B.I.* i 133, V 1, Water Cress; is given in *Gamble's Flora of the Presidency of Madras* i 37, as on the Nilgiris, probably introduced.

RESEDACEÆ.

A very small family of the temperate parts of the old world.

RESEDA. F.B.I. 12 I.

Herbs with alternate, entire or lobed leaves, and glandular stipules. Sepals and petals 4 to 7, the latter unequal, much cut, and posterior one with a membrane above its stalk. Stamens 10 to 40. Ovary one-celled, with three parietal placentas. Fruit a capsule, opening at the top.

Species about 30, in North Africa and West Asia.

Reseda luteola *L.* Mignonette, the common garden plant, is reported as a weed about Ootacamund.

VIOLACEÆ.

See Vol. I p. 20.

BIXACEÆ.

Trees with alternate stipulate leaves. Sepals and petals 4 to 6, stamens indefinite, or not. Ovary one-celled.

Species about 200, chiefly tropical.

KEY TO THE GENERA.

Flowers in spikes; petals small; stamens many . . SCOLOPIA.
Flowers axillary; petals ½ inch, each with a scale nearly as long lying in it; stamens as many; fruit large grooved from apex to base . . . . HYDNOCARPUS.

SCOLOPIA. F.B.I. 14 II.

A small genus in Asia, Africa and Australia.

Scolopia crenata *Clos.*; *F.B.I.* i 191, II 3. A medium sized tree. Young branches brown, with rough bark and many small lenticels. Leaves ovate, 4 by 2 inches, the margin indented with shallow and irregular serratures from near the base to the obtuse or short acuminate tip, glabrous on both sides; lateral nerves 6 to 8 pairs. Flowers in axillary simple or compound racemes; pedicels ¼ inch. Calyx tube ½ inch, narrow tubular, obconic above ⅙ inch; sepals and petals 5, each about ⅛ by ½ inch. Stamens numerous, straight, in apparently more than two rows, white; anthers small round. Ovary glabrous, one-celled in early fruit ovoid; style thick ½ inch or ⅓ inch, stigma three-lobed. Ovules numerous, anatropous, erect, from 3 or 4 parietal-placentas. t. 287.

Nilgiris: Coonoor, common on Lamb's Rock Road at 6,000 feet. *Fyson* 6205.

Gen. Dist. Western side of S. India.

HYDNOCARPUS. F.B.I. 14 IV.

Almost always a diœcious tree, the male and female flowers on different trees. Petal with a scale lying along it.

Species about 6, chiefly Australian.

Hydnocarpus alpina *Wight*; *F.B.I.* i 197, IX 3. A tree of the dense shola, with very dark green almost black foliage, and brilliant red young leaves. Branchlets zig-zag; leaves alternate, narrow ovate-acute, with 6 to 8 pairs of nerves visible above and the smaller nerves distinct below. Flowers few in short axillary spikes. Sepals ovate, nearly equal, or the inner two slightly larger. Petals 5, white, ¾ inch by ⅛ inch, linear, the margins folded to hide the oblong scale which lies against each petal and is about half as long: this scale has a truncate fimbriate end. Stamens 5; filaments short; anthers ⅙ inch, curved, not reniform. Male flowers with rudimentary ovary. Female flowers with fully formed stamens, the anthers of which however do not open; ovary globose, surmounted by the broad, pink, lobed stigma. Fruit ovoid the size of a fair-sized apple, or custard apple. t. **288**. Wt. Ic. t. 942.

Nilgiris: Coonoor, etc., on slopes 6,000 feet and under, forming often dense woods of this species alone. *Fyson.*

Gen. Dist. Western Ghats and Ceylon, in moist valleys.

PITTOSPORACEÆ.

See Vol. I p. 23.

POLYGALACEÆ.

See Vol. I p. 26.

CARYOPHYLLACEÆ.

See Vol. I p. 29, and add to bottom of page 30 inside bracket d:

Leaves linear; petals minute or o . . . . . . SAGINA.

CERASTIUM.

Vol. I p. 32 and II t. 26, for **Cerastium vulgatum** *L. var* glomerata *Thuillier* read **C. glomerata** *Thuill.*

STELLARIA.

See Vol. I p. 33.

KEY TO THE SPECIES.

a { Plants with tomentum of stellate hairs . . . S. saxatilis
  { Hairs simple . . . . b

b { Flowers in long-peduncled cymose panicles; seed one only S. paniculata.
  { Flowers axillary; seeds many in the capsule, Vol. I p. 33. S. media.

Stellaria paniculata *Edgew.*; *F.B.I.* i 229, XI 2. Stem 2 feet. Leaves 1 to 2 inches, variable in shape. Flowers small. Young ovary three-celled, but when ripe with only one wrinkled seed.

Nilgiris: 6,000 to 8,000 feet.

Gen. Dist. Temperate Himalayas, Kashmir and Khasia.

Stellaria saxatilis *Ham.*; *F.B.I.* i 232, XI 14. Stem 2 to 3 feet, decumbent below, densely tomentose above. Flowers in umbel-like cymes, with very slender pedicels of 1 to 1½ inches. Petals ⅛ inch, two-partite. Capsule 5-valved. Seeds tubercled.

Nilgiris, as a weed.

Gen. Dist. Temperate Eastern and Central Himalayas, Khasia and across to Java, Siberia and Japan.

SAGINA. F.B.I. 18 XIV.

Herbs with very narrow leaves connate at the base, but without stipules. Sepals free. Petals not notched, usually minute. Stamens 4 or 5, or 8 to 10. Styles 4 or 5 opposite the sepals, and also to the valves of the capsule.

Species about 10, in temperate regions.

Sagina procumbens *L.*; *F.B.I.* i 242, IV 1. A perennial herb, 1 to 6 inches with procumbent branches forming a tuft. Leaves subulate, bright green. Flowers solitary on very slender axillary pedicels, ⅛ inch. Sepals usually 4. Petals smaller, 4 or more.

Nilgiris: above 6,000 feet as a weed. [*G.F.M.P.*]

Gen. Dist. Throughout Europe and in North America, Australia.

POLYCARPON. VOL. I, p. 35.

For **P. loeflingieæ** *Benth. and Hk.*, etc., read **P. tetraphyllum** *L.* The former differs in the flowers all being sessile, and occurs on the plains. *Fyson* 6506. t. 289.

ELATINACEÆ.

ELATINE. F.B.I. 21 I.

Very small and tender herbs, creeping on mud, with opposite or whorled leaves and very small flowers, usually one to each node, pedicelled or sessile, of 2 to 4 sepals, petals and stamens, and a 3- to 5-celled ovary with as many styles.

Elatine americana *Arn.; F.B.I.* i 250, I 1. On mud in patches of 1 to 3 inches diameter, rooting at the nodes. Ends of branches ultimately ascending. Leaves ⅛ to ⅓ inch ovate, lanceolate, entire, narrowed to the base. Flowers 1/12 inch diameter. Sepals 3. Petals 3. Seeds curved, about 12.

Nilgiris. [*G.F.M.P.*]

HYPERICACEÆ.

HYPERICUM.

See Vol. I p. 36.

Add:

Hypericum humifusum *L.*; *F.B.I.* i 255, II 13. Similar in habit to H. Wightianum (Vol. II t. 30) but the

sepals unequal and with black glands inside the margin, and no gland-tipped teeth or stalked glands; and the ovary completely divided into three chambers.

Nilgiris. [*G.F.M.P.*]

Gen. Dist. Europe, Atlantic Islands and South Africa.

GUTTIFERÆ.

Trees with opposite leathery leaves and yellow or greenish juice. Flowers hermaphrodite or unisexual with the sexes on the same or on different trees. Sepals and petals 2 to 6. Stamens numerous, round a rudimentary ovary. Ovary in the female or hermaphrodite flowers of 2 to 12 cells, surrounded by a ring of staminodes. Fruit usually a berry with large seeds.

Species about 300, in the tropics.

GARCINIA. F.B.I. 23 I.

Trees with the characters given above and distinguished further by the stigma being sessile on the ovary, without style; the seeds solitary in each cell of the ovary; and the fruit a large berry with thick rind, and in our species scored with five deep grooves up to the stigma.

Species about 60 in tropical Asia, Africa and Polynesia.

Garcinia cambogia *Desrouss*; *F.B.I.* i 261, I 6 as var 2. Leaves broadly elliptic with or without a short acumen, quite entire, coriaceous dark green, with numerous fairly parallel side-nerves. Male flowers nearly sessile, in 3-merous, terminal sessile cymes: sepals and petals 4; buds large, the outer sepals bright yellow thick, the inner larger and greener; petals reddish, ½ by ⅓ inch; stamens 20 or 30 in a square mass with often no pistillode. Female or hermaphrodite with deeply lobed stigma, sessile on the ovary. Fruit ovoid, 1½ by

2 inches, deeply grooved from the base to near the top where the stigma persists. t. 290. Wt. Ic. tt. 960, 961.

Nilgiris: Coonoor in the jungles of the slopes and on roadside, 6,000 feet. *Fyson* 6201.

TERNSTRŒMIACEÆ.

See Vol. I p. 40.

MALVACEÆ.

See Vol. I p. 43, but for the key to the genera on p. 44 substitute:

a	Fruit a capsule	b
	Fruit separating into its constituent carpels	c
b	Tall herb with entire or lobed leaves (Vol. I p. 46 and t. 36)	HIBISCUS.
	Low herb with much dissected leaves (Vol. I p. 45 and t. 36)	MODIOLA.
c	Styles as many as the carpels, i.e., 5	SIDA.
	Styles twice as many, i.e., 10	URENA.

SIDA. F.B.I. 26 IV.

Herbs or undershrubs with toothed leaves, and linear stipules. All green parts pubescent with simple or stellate hairs. Flowers of the family type, but the fruit splitting into five carpels, which may or may not have each two awns at the top. Radicle in the seed pointing upwards.

Sida rhomboidea *Roxb.*; *F.B.I.* i 324 as *var* rhomboidea of S. rhombifolia *Masters*. A wayside weed, 1 to 2 feet, leaves 1 to 2 inches, ovate, toothed in the distal half, entire and more or less cuneate in the nearer. Flower stalks longer than the short petioles, jointed at the base. Flowers pale yellow. Carpels 6 to 10, with very short or no awns. t. 291.

Nilgiris: Coonoor, on waysides. *Fyson* 6490.

S. rhombifolia is separated in *Gamble's Flora of the Madras Presidency* because the peduncle is jointed about the middle and the carpels are awned.

URENA. F.B.I. 26 VI.

Similar in habit to SIDA but the flowers with an epicalyx of 5 bracteoles attached to the calyx, and the styles twice as many as the carpels. Ripe carpels covered with hooked bristles. Radicle in the seed pointing downwards.

Species very few, in tropical countries.

Urena lobata *Linn.*; *F.B.I.* i 329, VI 1. An undershrub with slender branches covered as are all green parts with stellate hairs. Leaves deeply lobed, palmately or pinnately, the middle lobe in the lower leaves much the largest, and with shallow serrations all round the margin; dark green above, lighter below. Flowers solitary or two or three of unequal ages, in the leaf axils. Calyx of ten parts, five outer green bracteoles, five inner lighter and thinner sepals. Corolla 1 inch diameter, pink with darker centre, usually turned down or to the back, and more so with age. Staminal tube cylindrical, with only a few scattered anthers attached near the upper end, which is entire not toothed. Stigmatic arms 10, capping the staminal tube. Ovary five-celled. Fruit of 5, one-seeded parts, thickly covered with hooked bristles. t. **292**.

Nilgiris: Coonoor and at lower levels.

Gen. Dist. Throughout the hotter parts of India, and in the tropics generally.

TILIACEÆ.

In Vol. I the genus ELÆOCARPUS alone is described, and it was stated that this genus is by some separated as a distinct family. This is done in *Gamble's Flora of the Madras Presidency*. Of the true TILIACEÆ we have:

TRIUMFETTA. F.B.I. 28 IX.

Herbs or shrubs with alternate leaves and all green parts covered with stellate hairs. Flowers yellow, with five sepals and petals, ten or more stamens springing from a fleshy lobed and distinctly raised torus, and a 2 to 5 celled ovary with filiform style. Fruit a round capsule covered with long spines.

Species about 60, tropical weeds.

Triumfetta pilosa *Roth.*; *F.B.I.* i 394, IX 2. A herb covered with bristles on bulbous bases. Leaves hairy on both sides, the lower three-lobed, the upper ovate or ovate-lanceolate, unequally toothed, about 4 by 2½ inches with petiole ¾ inch and subulate stipules. Flowers ¾ inch, yellow. Fruit including the spines, 1 inch diameter; four-celled; with two seeds in each cell.

Nilgiris: Coonoor at 6,000 feet, on roadsides. *Fyson* 6507.

ELÆOCARPACEÆ.

See Vol. I p. 47, under TILIACEÆ.

ELÆOCARPUS.

Add to this genus:

Elæocarpus munroii *Masters*; *F.B.I.* i 407, XIII 32.

A tree. Leaves long-stalked, drooping, glabrous with wavy margin, broadly ovate acute, about 4 by 3 inches. Flowers facing downwards, in short erect racemes above the terminal tufts of leaves, white and very prominent. Drupe about ¾ by ½ inch, smaller than in the other two species. t. 293. Wt. Ic. t. 952.

Nilgiris: Coonoor, very common and conspicuous in the early summer months. *Fyson* 3443.

GERANIACEÆ.

See Vol. I p. 52.

ERODIUM.

See Vol. I p. 53.

Erodium cicutarium *Leman* ; *F.B.I.* i 434, IV 1. Similar in habit to E. moschatum (Vol. I p. 53, and II t. 40) but the leaflets more deeply toothed or pinnatified.

A garden escape, naturalized on the Nilgiris. [*G.F.M.P.*]

GERANIUM.

Geranium nepalense *Sweet* ; Vol. I p. 52, t. 294.

BIOPHYTUM.

See Vol. I p. 57, and add :

KEY TO THE SPECIES.

a { Stem simple, terminal leaflets largest . . B. candolleanum.
Stem usually branched ; terminal leaflets not longest . b

b { Leaflets 15 to 25 pairs, pedicels 1/6 inch, sepals glandular (Vol. I p. 58 and t. 295) . . . . B. intermedium.
Leaflets 30 to 50 pairs ; pedicels 1/10 inch, sepals glabrous. B. polyphyllum.

Biophytum candolleanum *Wight* ; *F.B.I.* as *var.* Candolleanum of B. sensitivum i. 437, V 1. Stem simple, leaflets 10 to 15 pairs. Wt. Ill. t. 62.

Nilgiris : Coonoor, etc., 6,000 feet in shady places. *Fyson* 6508.

Biophytum polyphyllum *Munro* ; *F.B.I.* i 439, V 8. Stem stout umbellately branched. Leaves very long and flexuous with minute leaflets, 30 to 50 pairs, ⅛ inch long only ; rachis villous with long hairs.

Nilgiris : Kundahs, etc., 6,000 to 7,000 feet. [*G.F.M.P.*]

IMPATIENS.

See Vol. I p. 61, and for the Key on page 62 substitute

KEY TO THE SPECIES.

a { No ordinary leafy stem above ground, the leaves all from the rootstock ; flowers racemed on slender leafless stems (§ 1 *Scapigeræ*) . . . . d
Stem above ground leafy . . . . b

b { Flowers on axillary pedicels c
Flowers in very short umbel-like racemes, which are peduncled (§ 6 *Sub-umbellatæ*) . . . . p
Flower in distinct racemes, peduncled (§ 7 *Racemosæ*) . t

c { Sepals long. Annuals with opposite ls. (§ 3 *Annuæ*) . g
Sepals minute. Shrubs mostly (§ 4 *Microsepalæ*) . . . k
Sepals broad. Hairy shrubs (§ 5 *Tomentosæ*) . . . o

d { § 1 *Scapigeræ. Orchid Balsams. The wing petals are each cut into oblong lobes and together remind one of the lip of an orchid.*
Spur long incurved. Flowers pink . . . . e
Spur short, straight or curved. Flrs. pink or white . . f
Spur 0, Fls. 1/3 in. Epiphytes on trees (p. 15). I. orchioides.

e { Wing 2-lobed . . . . (p. 16). I. acaulis.
Wing 3-lobed . . . . (p. 16). I. scapiflora.

f { Flowers white ; spur inflated (Vol. I p. 63 and II t. 47). I. Beddomei.
Flowers pink ; spur straight (Vol. I p. 64 and II t. 48). I. modesta.
Flowers carmine pink ; spur curved . (p. 16). I. levingei.

g { §3 Annual *flowers in axillary pedicels. Annual herbs with opposite leaves.*
Spur long and slender . . . . h
Spur shorter than the flower . . . .
Spur 1/6 inch, stem red tomentose (Vol. I p. 65 andj II t. 52) . . . . I. tomentosa.
No spur . . . . j

h { Stem stiff, usually unbranched. Fruiting pedicels stiff (Vol. I p. 64 and II t. 49) . . . . I. chinensis.
Stem flaccid branched . . . . . (p. 16). I. diversifolia.

i { Wings long-stalked, no dorsal auricle . (p. 17). I. kleinii
Wings short-stalked, dorsal auricle bent down . (p. 17) I. tenella.

j { Stem 1 foot, firm. Flowers ¼ in. diameter. (Vol. I p. 65 and II t. 65) . . . . I. rufescens.
Stem very slender, under 1 ft. Flrs. small. (p. 17). I. pusilla.

k { § 4 *Microsepalæ. Leaves opposite, alternate or whorled. Flowers in slender axillary pedicels ; sepals minute. Mostly shrubs.*
Ls. opposite or whorled or alternate on the same plant . e
Leaves all alternate ; no spur . . . (p. 18). I. scabriuscula.

l { Basal lobes of wings smaller than the distal . . . . . m
Basal lobe equal to or larger than the distal . . . . . n

m { Stem reddish. Leaves 1 to 3 in. long; petiole short. (Vol. I p. 67, and II t. 53) . . . . I. leschenaultii.
Stem with white powdery covering. Leaves 2 to 4 inches petiole long . . . . (p. 17) I. latifolia.

n { Spur stout. Stem glaucous. Midrib of leaf hairy underneath . . . . (p. 17). I. cuspidata.
Spur slender. St. green. Lf. glabrous (p. 17). I. floribunda.

o { § 5 *Tomentosæ. Shrubby plants. Leaves hairy on both sides. Pedicels solitary in the leaf-axils. Standard and lip of flower tomentose.*
Flowers small, white or red, wings short (p. 18). I. munronii.
Flowers to $1\frac{1}{2}$ inches, across, white; wings large (p. 18). I. henslowiana.

p { § 6 *Subembellatæ. Flowers in umbels or umbel-like very short racemes, on axillary peduncles, the pedicels with bracts at the base.*
Shrubs. Leaves alternate . . . . q
Herbs. Leaves opposite . . . . s

q { Flowers white, bonnet-shaped, without spur (Vol. I p. 69 and t. 300) . . . . I. campanulata
Flowers pink, spur longer than lip . . . . r

r { Tall shrub under the shade of trees. Bracts slender (p. 19) I. fruticosa.
Herb of wet ground. Bracts ovate (p. 19 and t. 299) I. viscida

s { Leaves ovate, long-stalked (Vol. I p. 60 and II t. 55) I. goughii.
Leaves oblong or elliptic, subsessile (p. 19) . . I. omissa.

t { § 7 *Racemosæ. Leaves alternate. Flowers in peduncled axillary racemes. Pedicels bracteate at the base. Sepals broad. Lip spurred.*
Leaves ovate, long-petioled. Flowers scarlet; lip tubiform (Vol. I p. 70, and II t. 56) . . . . . . I. phœnicea.
Leaves lanceolate, subsessile. Flowers pink: lip boat-shaped . . . . (p. 19) I. tangachee.

Impatiens orchioides *Bedd.*; *F.B.I.* i 443, VIII 5. A very small plant, epiphytic on tree trunks. Flowers reddish brown, ⅓ inch diam. Leaves ovate-cordate, acuminate, very hairy above, glabrous beneath. Bedd. Ic. t. 152.

Nilgiris: Avalanche.

Impatiens acaulis *Arn.*; *F.B.I.* i 443, VIII 6. Stem 2 to 12 inches. Leaves round, ovate-cordate, or oblong, usually on slender petioles, more or less crenate: in general with the habit of I. scapiflora (below). Wings two-lobed. Spur long and slender.

Nilgiris and Western Ghats, to 7,000 feet.

Impatiens scapiflora *Heyne*; *F.B.I.* i 443, VIII 7. Leaves ovate-oblong, shallowly cordate, serrate from base to apex, 2½ to 4 inches long, on petioles of 2 to 4 inches. Scapes as long or longer, perfectly glabrous. Flowers racemed near the top, deep pink on slender 1 inch pedicels. Wings 1 inch long, deeply cut into 3 unequally wide lobes; standard (hood) ⅓ inch; spur 2 inches, incurved. t. 296. Wt. Ic. 751.

Nilgiris: Coonoor, common on Lamb's Rk. Rd. *Fyson* 6237, 6340.

Gen. Dist. Western Ghats, from South Kanara to Travancore, 6,000 to 8,000 feet.

Impatiens levingei *Gamble.* Similar in habit and in the general form of the flower to I. Beddomei *Hook. f.* (I. clavicornu *Turc.*, Vol. I p. 63 and II t. 47) but flowers carmine red not white and spur incurved, and not inflated at the tip.

Nilgiris: Coonoor, etc., at 6,000 feet on rocks.

Impatiens diversifolia *Wall.*; *F.B.I.* i 446, VIII 15. Diffuse with ascending succulent branches which root at the lower nodes. Leaves all opposite, ½ to 3 inches; lowest smallest petioled, upper often dilated at the base. Pedicels, slender, solitary or in pairs, in the leaf axils, deflexed in fruit. Flowers flat, rosy; spur curved upwards, as long or longer than the flower. Seeds dark brown, smooth, shining.

Nilgiris: to 6,000 feet.

Gen. Dist. Western Ghats, South Kanara to Travancore.

Impatiens kleinii *W. & A.*; *F.B.I.* i 445, VIII 14. Stem very slender, branched. Ls. 1 to 2 in., elliptic, acute at both ends. Spur very slender. Wings spathulate not cleft.

W. Ghats: 6,000 feet. [*G.F.M.P.*] *Fyson*, 5301.

Impatiens tenella *Heyne*; *F.B.I.* i 447, VIII 17. A small plant 4 to 10 inches, with slender stems and narrow sessile leaves. Pedicels ½ to 1 inch, usually in pairs, horizontal, not deflexed in fruit. Flowers ¼ inch diameter, pink, spur shorter.

Nilgiris : 6,000 feet, Courtallum.

Gen. Dist. Mountains of Malabar, etc.

Impatiens pusilla *Bentham*; Vol. I p. 65, and Vol. II t. 50, as **I. inconspicua** *Benth.*; *G.F.M.P.* i 140. Wt. Ic. t. 750 under name *I. rosmarinifolia.*

Impatiens latifolia *Linn.*; Vol. I p. 68, but add: Stems covered with sulphury powder. Flowers pale purple.

Western Ghats, South Kanara to Pulneys, up to 8,000 feet.

I. cuspidata *Wt.; F.B.I. included in I. latifolia; G.F.M.P.* i *142.* A shrub, 3 to 5 feet, well branched. Stems and branches covered with bluish white powder. Leaves alternate, opposite or several at a node, often unequal in size. Flowers pale pink; standard broadly obcordate, nearly flat; lip small with long straight spur; basal lobe of wings longer than the distal and notched. t. Wight Ic. t. 741.

Nilgiris: Coonoor on Lamb's Rock Road, common. May—September. *Fyson* 6204, 6338, 6550.

Impatiens floribunda *Wt.*; *G.F.M.P.* i 142. Habit of the last two, but inner lobe of wing quite small.

Nilgiris to Travancore, 6,000 to 7,000 feet.

Impatiens scabriuscula *Heyne*; *F.B.I.* i 454, VIII 38. A small plant, 4 to 10 inches, branched from the base. Leave petioled, narrowly elliptic lanceolate to obovate, 1 to 2 inches. Flowers ½ inch pink. Lip and standard hairy. Wings three-lobed, the middle lobe more than twice the outer, and the inner lobe very small. No spur. Capsule ⅓ inch, ellipsoid, mucronate, villous. Seeds few, globose dark brown, tubercled. Bedd. Ic. cxliv.

Nilgiris: 6,000 feet. [*G.F.M.P.*]

Gen. Dist. Western Ghats, from South Kanara and Coorg to Wynaad and Nilgiris.

The entire absence of even a vestige of a spur is remarkable in a Balsam.

Impatiens munronii *Wt.*; *F.B.I.* i 456, VIII 48. An undershrub up to 2 feet, sparingly branched. Leaves hairy on both sides, 3 to 4 by 1½ to 2 inches, elliptic, acuminate. Flowers white on axillary pedicels; standard helmet-shaped; spur hairy like the leaves, tapering nearly evenly from the boat-shaped lip to the slightly swollen curved tip (similar to that of *I. phœnicia*, Vol. II t. 56). Wt. Ic. t. 1049.

Nilgiris: Sispara jungles in dense shade [*Wight*].

Impatiens henslowiana *Arnott*; *F.B.I.* i 458, VIII 53. An undershrub easily recognized among Balsams by the very large white flowers. Branches with prominently swollen leaf scars. Leaves 3 to 5 inches, crowded at the ends of the branches, petioled, elliptic, hairy on both sides. Flowers 1 to 2 inches diameter on stout axillary pedicels, white with pinkish tinge at the base of the petals. Wings deeply divided into two broad flat parts, the distal ones also notched. Spur longer, curved up slightly. t. 297. Wt. Ic. t. 743.

In ravines and clefts of rocks, and on steep banks, up to 7,000 feet. Pulneys: near Poombarai, Neutral saddle, etc. *Fyson* 545. *Bourne* 807.

Gen. Dist. Western Ghats, 2,000 to 7,000 feet.

Impatiens fruticosa *DC.*; *F.B.I.* i 459, VIII 57. An erect much branched shrub, up to 8 feet high. Branches glabrous but leaves hairy on the underside; peduncles 1 to 2 inches, dividing into 3 or 4 pedicels bearing the flowers. Flowers 1½ inches, pink; lobes of the wings 2, well separated; spur 1 to 1½ inches. Capsule erect. t. 298. Wight Ic. t. 966.

Nilgiris: Coonoor and Kotagiri, near streams in jungles. *Fyson* 6500, 6541.

Gen. Dist. Western Ghats, Nilgiris, Pulney and Travancore hills, 5,000 to 6,000 feet.

Impatiens viscida *Wight, Herb Prop.!*; *F.B.I.* i 462, VIII 65. A small herb of very wet rocks. Stems red, decumbent and rooting at the lower nodes. Leaves petioled, ovate-acute, about 2 by 1½ inches. Flowers light purple or pink, two or three together on a slender axillary peduncle of about 2 inches; bracts ¼ inch; sepals ⅓ by ¼ inch, light brown; hinder lobe of wing about one-third only the size of the distal, which is nearly semi-circular in shape and ¾ inch long; standard ⅓ inch, concave; spur 1 to 1¼ inches, bent at upper end then lying nearly straight close under and parallel to the wings, in bud curled up over the rest. Capsules erect. t. 299. Wt. Ic. t. 746.

Pulneys: Kodaikānal or Jesuits walk near Pāmbar, etc., on dripping rocks. *Fyson* 1096, 2154, 4124.

Gen. Dist. Madura and Tinnevelly hills, 3,000 to 7,000 feet.

Impatiens omissa *Hk.f.*; *Rec. Bot. Sur. IV, p.* 43. A very small, slender annual herb. Leaves all opposite, oblong or elliptic subsessile, ¼ to 1 inch long. Flowers in many—flowered short umbel-like racemes, on long peduncles.

Western Ghats, Anamalai and Pulney hills, 6,000 to 7,000 feet.

Impatiens tangachee *Bedd.*; *F.B.I.* i 467, VIII 82. Stem 6 to 15 inches, usually unbranched. Leaves crowded towards the top, oblanceolate, finely-serrate. Flowers in racemes, the lower flowerless part of the peduncle longer than the leaves; bracts ⅛ inch; pedicels 1 inch. Flowers rose-pink; standard helmet-shaped; terminal lobe of wing with broadly truncate, erose tip; lateral lobe ⅓ inch long; spur 1 inch, nearly straight. Bedd. Ic. t. 147.

Pulneys: in streams at 5,000 feet, etc. *Fyson* 501. *Bourne* 2831.

Gen. Dist. Anamalais, above 4,000 feet, Bolampatti hills.

RUTACEÆ.

See Vol. I p. 71.

KEY TO THE GENERA.

a { Leaf simple, flowers in long-peduncled cyme, stamens 8. b
Leaves opposite, leaflets 3; a small tree (Vol. I p. 73, t. 301). Evodia lunur-ankenda *Merr.* Formerly known as E. Roxburghiana *Benth.*
Leaves alternate, leaflets 3 or more; erect or climbing shrubs c

b { Leaves opposite; peduncles decurved; flowers few . . . MELICOPE.
Leaves alternate, peduncles erect, flowers many . . . . ACRONYCHIA.

c { Petals 1 inch, sweet scented; unarmed shrubs. . MURRAYA
Flowers ¼ inch; prickly shrubs and climbers . . . d

d { Leaflets 3 to 5, carpels in fruit dry with one black seed, wood yellow (Vol. I p. 75) . . . . . XANTHOXYLUM.
Leaflets 3 only, often climbers with warty stems, fruit a small yellow berry . . . . TODDALIA

MELICOPE. F.B.I. 33 VII.

Shrubs with opposite 1 to 3-foliate leaves, and the parts of the flower in fours (eight stamens). Fruit of four parts which open on the inner side.

Species about 20, chiefly in Polynesia.

Melicope indica *Wt., F.B.I.* i 492, VII 1. A shrub or small tree. Leaflet one only, shining, 3 to 4 inches long narrowed to the base with long petiole. Flowers ⅓ inch diameter, two or three together on axillary peduncles of 2 to 4 inches. Carpels in fruit ½ inch, one-seeded. Wt. Ic. 1051.

Nilgiris in woods near Avalanche, on the Kundahs.

TODDALIA.

Toddalia asiatica *Lamk.* called T. aculeata *Pers.* in Vol. I p. 72.

Var. floribunda. This is the plant described in Vol. I, a climbing shrub. Vol. II t. 57.

Var. obtusifolia. An erect shrub, with obtuse leaflets in roadside hedges near Kotagiri. *Fyson* 6219, 6361.

ACRONYCHIA. F.B.I. 33 X.

Trees with 1 rarely 3-foliate leaves, and small flowers in long-peduncled cymes, the parts in fours (stamens 8). Ovary not deeply lobed, fruit a 4-celled drupe.

Species few, in tropical Asia, Australia and the Pacific islands.

Acronychia laurifolia *Blume*; *F.B.I.* i 498, X 1. Leaflet 3 to 9 inches, thick, peduncles 3 to 6 inches, cymes as broad corymbs. Petals with white hairs inside at the base. t. 302. Wight Ill. t. 65.

Nilgiris: Coonoor on roadsides, not above. Pulneys: Shembaganur, etc. *Fyson* 6253.

MELIACEÆ.

Trees with pinnate or bi-pinnate leaves and rather small flowers in large axillary panicles, characterized by the stamens being united into a tube bearing the anthers sessile in the inner side. Fruit a drupe.

ARNOLD
ARBORETUM
HARVARD

Species about 400 mostly in the tropics of both hemispheres, and especially in the Indian Archipelago. Common trees of the plains are Azadirachta indica *L.*, the Neem or Margosa; Melia azedarach *L.*, the Persian Lilac; Chloroxylon swietenia *DC.*, the Satin Wood or White Cedar; Cedrela toona *Roxb.* Swietenia mahagoni *L.*, Mahogany, a native of the West Indies, is planted in gardens.

KEY TO THE GENERA.

Stamens united into a tube, each one with two lateral teeth . . . HEYNEA.

Stamens free, leaves 2 to 3 feet long, leaflets many, 2 to 7 inches long . . . . CEDRELA.

HEYNEA. F.B.I. 37 XIII.

Trees. Leaflets opposite, with one terminal, quite entire. Panicles terminal and axillary, on long peduncles. Flowers small. Stamens connate into a tube, with two teeth to each on either side of the anther. Stigma thickened at the base, two to three cleft at top. Fruit one-celled, seeds surrounded with fleshy aril.

Species very few in India and adjacent islands.

Heynea trijuga *Roxb.*; *F.B.I.* i 565, XIII 1. A small or large tree. Leaflets ovate-oblong or lanceolate, acuminate, glabrous above. Flowers in corymbose panicles standing above the leaves, small, pale cream in colour, with bright orange-yellow stamens massed in the centre. Fruit round, opening in two valves, with one seed. t. 303. Bedd. Fl. Syl. t. lxxxiv; Curt. Bot. Mag. t. 1738.

Nilgiris: Coonoor, on roadsides and at lower level, common. *Fyson* 6489.

Gen. Dist. Eastern and Western Ghats, to 6,000 feet, forests of Oudh, and the Himalaya, Khasia Mountains and southwards to Penang.

CEDRELA. F.B.I. 37 XVIII.

Cedrela toona *Roxb.; F.B.I.* i 568, XVIII 1. A handsome tree, with large pinnate leaves and small

white flowers. Leaves 2 to 3 feet; leaflets glossy; ovate acute 2 to 6 inches long. Panicles 1 foot or more. Calyx 1/16 inch. Corolla ¼ inch. Fruit oblong, 1 to 1½ inches; seeds winged.

Nilgiris: Wild or planted, here and there on the plateau—Kotagiri, Coonoor.

ICACINACEÆ.

See Vol. I p. 74.

KEY TO THE GENERA.

a	Flowers in large terminal cymose corymbs	b
	Flowers axillary, few; petals lightly united.	GOMPHANDRA.
b	Anthers divided at the base; embryo small. .	APODYTES.
	Anthers oblong, embryo large; flowers often fœtid.	MAPPIA.

GOMPHANDRA F.B.I. XXXIX.

A small genus of under ten species, natives of tropical Asia.

Gomphandra coriacea *Wt.; F.B.I.* i 586 in part. A small tree or shrub with young branches, and both sides of leaves, all equally green. Leaves variable, elliptic or obovate, glabrous. Flowers solitary or in few-flowered cymes, in the axils or outside them, greenish white. Calyx minute. Petals erect, 1/6 inch, irregularly connate into a tube, tips inflexed. Stamens with very thick filaments and small anthers pendulous from the inside. Ovary oblong as long as the filaments, surmounted by the large lobed stigma, without style. Fruit pale clear yellow, about 2 inches long, with the 5-angled stigma 1/8 inch, wide at the top. Stone with wrinkled skin. Seed with raphe completely round from top to bottom.
t. 304. Wt. Ic. 953, 954.

Nilgiris: on the outskirts of heavy sholas, 3,000 to 6,000 feet, Coonoor, etc. Pulneys at Kodaikanal and below. *Fyson*, 4826, 6339.

Gen. Dist. Western Ghats.

MAPPIA.

See Vol. I p. 74.

KEY TO THE SPECIES.

a { Flowers fœtid . . . . b
Flowers not fœtid, leaves ovate abruptly acuminate M. ovata.

b { Leaves subcoriaceous, stellately tomentose below . . . . M. tomentosa.
Leaves elliptic, ovate or oblong, puberous below . . . . M. fœtida.

In Vol. I l.c. M. ovata was included in M. fœtida. *G.F.M.P.* gives the other two species as above 5,000 feet, but no elevation for M. ovata.

AQUIFOLIACEÆ.

See Vol. I p. 75, under name ILICINEÆ.

ILEX.

Add:

Ilex gardneriana *Wt.; F.B.I.* i 603, I 15. A shrub or small tree. Leaves ovate-lanceolate, acuminate, 2 to 3 inches, with rounded base. Flowers on stalks of ¼ inch in solitary or fascicled umbels on peduncles of ½ inch. Sepals and petals 5. Wt. Ic. 1217.

Nilgiris: Sispara, 6,000 feet. [*Wight.*]

Ilex denticulata *Wall.*; Vol. I p. 76. t. 305.

CELASTRACEÆ.

See Vol. I p. 77, but add at head of the key to the genera;

Leaves alternate. Tree. Flowers in axillary dichotomous cymes . . . . GYMNOSPORIA.

MICROTROPIS.

See Vol. I p. 79 and add:

Microtropis latifolia *Wight; F.B.I.* i 613, III 2. A small tree with almost black branches. Leaves 4 to 7 by 2 to 4 inches pale green, very coriaceous and with thickened margin, petioled, oblong-lanceolate, or elliptic

ovate, acuminate, prominently rugose above, the nerves obscure on both surfaces. Flowers small. Capsule 3 to 4 inches ellipsoid. [*G.F.M.P.*]

Western Nilgiris, Bolampatti Hills, 2,000 to 6,000 feet.

CELASTRUS.

Celastrus paniculata *Willd.;* Vol. I p. 81, and II t. 63. Add:

Ripe capsule a brilliant orange colour.

GYMNOSPORIA. F.B.I. 41 VIII.

Trees with alternate leaves, and dichotomous axillary cymes of small flowers. Fruit a globose or obovoid, often angular, capsule with one or two arillate seeds in each cell.

Species about 60 in the hotter parts of the world.

Gymnosporia ovata *Lawson*; *F.B.I.* i 619, VIII 7. A shrub, no thorns. Leaves very hard and thick, drying dark green or blackish and roundish, about two inches long, crenulate. Flowers very small, in dense fascicles of ½ to 1½ inches, on short peduncles. Fruit ½ inch, broadly obovate, three-celled: seed with aril only at the base. t. 306.

Nilgiris: on the plateau at Kodanad, etc. *Fyson*, 6364.

Pulneys: Poombarai, etc. *Bourne* 837.

RHAMNACEÆ.

See Vol. I p. 82, and substitute for the key to the genera:

a	Flowers egg-shaped, very woolly	POMADERRIS.
	Flowers flat, not woolly	b
b	Leaves opposite or nearly so	SCUTIA.
	Leaves alternate distinctly	c
c	Thorns stipular, curved; flowering branches leafless . . .	ZIZYPHUS.
	Branches spiny or not; fruits in axillary fascicles . . .	RHAMNUS.

ZIZYPHUS. F.B.I. 42 III.

Trees and shrubs, with alternate leaves and often the stipules modified as curved or straight prickles. Flowers fascicled in the axils, or in sessile or peduncled cymes. Disc completely filling the calyx so that the receptacle is flat. Fruit fleshy with hard stone.

In most (all ?) species the leaf has three main veins starting from the base. The mid-rib gives off short lateral nerves pinnately; the other two main veins curve outwards and then inwards to meet at the tip and give off conspicuous nerves on the outer-side, but hardly any inwards. The whole venation is so peculiar as almost to suffice to identify the genus, but some species of Rhamnus are very similar.

Species about 50, in tropical Asia and America, and in temperate regions.

On the plains there are several species, quite common.

Zizyphus rugosa *Lamk.*; *F.B.I.* i 36, III 147. A large straggling shrub, armed with solitary curved prickles. Leaves 2 to 4 inches elliptic, glabrous on the upper, densely tomentose on the lower side. Flowers in long peduncled cymes on leafless branches, forming large panicles. Fruit fleshy, small with one stone and one seed.

Nilgiris: Ghat road just below Coonoor, etc. Pulneys, Poombarai and on Ghats to 6,000 feet. *Fyson* 651, 1084, 6551.

Genl. Dist. Common in dry deciduous forests on the Western Ghats, 6,000 feet.

SCUTIA. F.B.I. 42 VII.

Shrubs with opposite or sub-opposite leaves and axillary fascicles of small flowers, in which the disc fills the calyx tube. Fruit half superior, surrounded at the base by the calyx tube.

Species about 10, in Asia, Africa and tropical America.

Scutia myrtina *Kurz*; *F.B.I.* i 842, VII. A straggling shrub. Leaves opposite or sub-opposite, about 1 inch round obovate coriaceous, shining. Flowers yellowish.

Nilgiris ; near Kotagiri, etc., at about 5,500 feet. *Fyson* 6225.

Gen. Dist. In dry deciduous and scrub forest, in Northern Circars, Deccan and Carnatic. Eastern slopes of Western Ghats.

VITACEÆ.

See AMPELIDACEÆ, Vol. I p. 86.

As indicated on page 87 the genus VITIS has now been split up to smaller genera. Of these we have :

Lfs. 3 only, petals 5, seeds smooth . . . PARTHENOCISSUS.
Leaflets 3 or 5, pedate ; petals 4 ; stigma four-lobed . . . TETRASTIGMA.
Leaflets 7 or 9, pedate ; stigma obscure . . . CAYRATIA.

TETRASTIGMA.

Climbers with simple or forked tendrils, leaves usually five-foliate, pedate, but also with 3 or 1 leaflet only. Flowers polygamo-diœcious. Petals 4, spreading. Stigma four-lobed. Seeds globose with two furrows on face and a prominent chalaza on the back.

Tetrastigma muricatum *Gamble* ; *F.B.I.* i 660, as **Vitis lanceolaria** in part. Stem warty. Leaves usually three-foliate, sometimes with five leaflets ; leaflets acute, glabrous, serrate. Seeds pyriform with shallow grooves on the face and oblong chalaza. t. 307. Wt. Ic. 177.

Nilgiri and Pulney Hills, below 6,000 feet common. *Fyson* 1188, 2433, 4114, 6399.

Gen. Dist. Western Ghats.

PARTHENOCISSUS.

Climbing shrubs with much branched tendrils opposite the leaves, which attach themselves by discs. Leaves three-foliate. Petals 5. Seeds globose with narrow raphe half round it.

Parthenocissus neilgherensis *Planch.* ; given in Vol. I p. 87, and II t. 67, as **Vitis anamalayana** *Bedd.*

CAYRATIA.

Flowers all bi-sexual; climbing shrubs with tendrils opposite the leaves. Petals 4, valvate. Seeds two grooved, slightly angular, or endosperm T shaped.

Cayratia pedata *Juss.*; *F.B.I.* i 661 as *Vitis pedata* Vahl. A large climber, with cylindrical hirsute branches. Leaflets usually seven; on long stalks 4 to 8 by 1½ to 3 inches, oblong lanceolate, acuminate, serrate. Petiole 6 inches. Flowers in widely branching corymbose cymes, green. Fruit globose, white. Seeds ⅛ inch semi-hemispherical, hollowed out on the flat side and the opening closed by a membrane. [*F.B.I.*]

Nilgiri and Pulney Hills below 6,000 feet. *Fyson* 1186, 6471.

Gen. Dist. Bengal, Silhet, Khasia and to Burma and Singapore, and down the Western Ghats.

SAPINDACEÆ.

See Vol. I p. 88.

KEY TO THE GENERA.

Petals 4, stamens inserted inside the disc, trees with three-foliate leaves .. .. ALLOPHYLUS.
No petals, stamens inserted outside the disc, shrubs with simple leaves ... ... DODONŒA.

ALLOPHYLUS. F.B.I. 44 V.

Small trees or shrubs with simple or three-foliate leaves and small globose, polygamo-diœcious flowers, white or yellowish, in simple or branched axillary spikes. Sepals 4. Petals 4, small or obsolete, naked inside or with a reflexed shaggy scale. Disc of four glands. Stamens 8, inside the disc. Ovary usually two-lobed, of 2 cells with one seed in each cell. Fruit indehiscent; seeds erect with short aril, embryo curved, cotyledons folded.

Species about 20, chiefly in tropical America, also Africa, tropical and South Madagascar and Indian Archipelago.

Allophylus serratus *Radlk.*; *F.B.I.* as part of A. Cobbe *Bl.*, described as a very variable species, i 673, V. 2. A tree. Leaflets 3, elliptic or obovate, cuspidate, about 2½ by 1¼ inches; petiole 2 inches. Spikes unbranched, longer than the petiole but shorter than the whole leaf, with cyme-like fascicles of small globular flowers, about 1/12 inch across. Petals with a hairy scale on the inside. Fruit ¼ inch ovoid, embraced at the base by the small sepals. t. 308. *Roxb. Fl. Cor.* t. 61.

Nilgiris: About Coonoor and lower down. *Fyson* 6543.

In *Gamble's Fl. Mad. Pres.* five species are given, four being included in A. Cobbe in the *F.B.I.*

STAPHYLEACEÆ.

See Vol. I p. 88.

This order has been created to comprise certain genera of the Sapindaceæ of the *Gen. Plant* and *F.B.I.* of which we have here:

TURPINIA.

Turpinia nepalensis *Vent.*; Vol. I p. 90 and II t. 69. as **T. pomifera** *DC.*

Gamb. Fl. Mad. Pres. gives it as extending only to 5,000 feet. But it is abundant, and indeed often the chief tree in sholas up to at least 7,500 feet. At Coonoor at 6,000 feet it frequently occurs under the shade of other trees, but also as one of the larger. The foliage is very dark.

SABIACEÆ.

See Vol. I p. 91.

LEGUMINOSEÆ.

PAPILIONACEÆ.

See Vol. I p. 94, and add to the genera given in the key:

Herbs with pinnate leaves and jointed pods . . . . . .
SMITHIA (p. 33), LEPTODESMIA (p. 34), ALYSICARPUS (p. 35)

Erect shrub with three-foliate leaves and inflated pods . . .
(p. 31) Crotalaria notonii *W. & A.*

Climbing plants with three-foliate leaves . . . .
VIGNA (p. 36), DOLICHOS (p. 37)
Climbing shrubs with pinnate leaves : leaflets alternate . . .
(p. 38) DALBERGIA
Climbing shrubs with pinnate ls : lfts. opposite (p. 38) . .
DERRIS.

CROTALARIA.

See Vol. I p. 99, and to the key to the species add: in bracket a, near C. semperflorens.

Herbaceous undershrub with small stipules C. walkeri

and in bracket f, add:

Pods silky . . . . C. obtecta

at end of key add:

Leaves three-foliate, a well-branched bush . . C. notonii.

Crotalaria wightiana *Grah.* ; *F.B.I.* i 69 as part of C. rubiginosa. An erect shrub, of the sect. *alatæ,* covered with golden silky hairs. Leaves 1½ to 4 inches long, broadly ovate, obtuse, mucronate. Stipules and wing broad, flowers 1 inch long. Pod nearly 2 inches.

A handsome shrub, at lower levels than C. scabrella in these hills about 5,000 feet. Pulneys: Shenbaganur on the open hill side.

Crotalaria albida *Heyne*; Vol. I p. 105, and II t. 78; flowers in Kodaikānal early in the year.

Crotalaria calycina *Schr.*; Vol. I p. 105. t. 309.

Crotalaria leschenaultii *DC.*; Vol. I p. 106, and add: stem hollow; pod black when ripe. t. 310.

Crotalaria formosa *Graham*; Vol. I p. 107 and II t. 79; flowers not large; foliage bluey-green.

Crotalaria walkeri *Arn.*; *F.B.I.* ii 78 as var of C. semperflorens. A low undershrub. Stipules small. Leaves smaller than in the last species and the smaller nerves few and not prominent on the lower side.

Nilgiri and Pulney hills, up to 6,000 feet.

Crotalaria obtecta *Grah.*; *F.B.I.* ii 79, VIII 55. A straggling shrub densely clothed with brown silky hairs. Leaves 2 to 4 inches, nearly elliptic, obovate or oblong, velvetty above and below. Stipules narrow, ⅛ inch, racemes close, 12 to 20 flowered. Pod 1½ to 2 inches by ½ to ¾ inch, densely covered with short stiff brown hairs.

Nilgiris: 4,000 to 6,000 feet. Coonoor, etc. *Fyson* 6552.

Crotalaria notonii *W. & A.*; *F.B.I.* ii 82, VIII 66. A shrub 2 to 6 feet high. All parts thinly pubescent with yellowish hairs; stipules setaceous 1/5 inch. Leaves trifoliate, rachis ¾ inch, leaflets about as long, ½ inch, broad, obovate or elliptic, obtuse mucronate corymbose. Flowers in axillary racemes, forming a large corymbose panicle 2 feet across. Bracts and bracteoles linear. Calyx teeth subequal, reflexed. Corolla yellow; standard ⅜ inch wide and long, streaked with brown and with two oval brown marks at the base, bent quite back; wings ⅛ inch wide, horizontal over the very acute keel. Pod ⅓ inch, hardly longer than broad, with prominent incurved beak, finely pubescent; seeds 1 or 2, dark olive brown. t. 311. Wt. Ic. t. 752.

Nilgiris: Coonoor, on the slope above Brooklands estate, etc., at 6,000 feet, common; flowering best in September. *Fyson* 6241, 6404.

Gen. Dist. Western Ghats, Nilgiri and Anamalai hills, 4,000 to 6,000 feet.

The flowers have the scent of the English Melilotus.

Crotalaria striata *DC.*; *F.B.I.* ii 84, VIII 73. An erect low shrub, 2 to 4 feet, with robust thinly silky branches. Petioles 2 to 4 inches. Leaflets 3, 3 to 4 inches, obovate, oblong, obtuse. Flowers 20 to 50 in racemes of ½ to 1 foot, yellow striped with red. Pod cylindrical, ½ to 2 inches, slightly decurved, with 20 to 30 seeds.

Introduced on estates and now run wild near Coonoor (*C. Brown*).

Gen. Dist. Himalayas to Ceylon and Malacca.

TRIFOLIUM.

See Vol. I p. 110.

Trifolium dubium *Sibth.*; Vol. I p. 111, under name T. minus *Smith.*

Trifolium pratense *Linn.*; *F.B.I.* ii 86, X 1. Red Clover. A perennial erect herb, over a foot high, stipules broad. Leaflets oblong, obscurely toothed Heads of flowers 1 inch diameter. Flowers very dense, red. Pod one-seeded.

A common forage plant, introduced in the Nilgiris and now run wild. [*G.F.M.P.*]

INDIGOFERA.

See Vol. I p. 112, and add:

Indigofera endecaphylla *Jacq.*; *F.B.I.* ii 98, XVII 24. An annual herb with trailing stems 1 to 2 feet long. Leaves 1 to 3 inches, of 9 to 12 leaflets. Racemes up to 4 inches long, many flowered. Flowers small, purple. Pod ¾ to 1 inch.

Nilgiris, up to 6,000 feet.

Gen. Dist. Hills of Deccan and Mysore, Western Ghats, Coimbatore.

Indigofera pulchella *Roxb.*; Vol. I p. 113. Flowers purplish pink, mostly before the leaves. The keel and wings soon drop off and leave the reflexed standard and the staminal tube and pistil. Pods when ripe nearly horizontal. Flowers in the spring. t. 312.

PSORALEA.

Psoralea pinnata *Linn.*; Vol. I p. 114 and II t. 85.

The name is confirmed in *Gamble's Fl., Madras Pres.*

TEPHROSIA. F.B.I. 50 XXII.

Herbs or undershrubs with odd-pinnate leaves, recognizable as a rule by the very close straight nerves which run as an acute angle to the margins of the leaflet. Flowers pinkish or white in terminal or leaf-opposed racemes. Pods straight, many-seeded.

Species over 100 in the tropics of both worlds.

Tephrosia tinctoria *Pers.*; *F.B.I.* ii 111, XXII 4. An undershrub covered with golden-brown pubescence. Leaflets variable in number from 3 to 13, the end one usually the longest, glabrous above, pubescent below. Racemes peduncled. Flowers red. Pod slightly bent, 1 to 2 inches. Wt. Ic. t. 388.

Pulneys: on the slope above Shembaganur, etc. Nilgiris.

Gen. Dist. Western Ghats up to 7,000 feet, Mysore, Coimbatore and North Arcot.

LESPEDEZA. F.B.I. 50 XXX.

Herbs or undershrubs with pinnately three-foliate leaves and one-seeded indehiscent strongly-veined pods.

Species few.

Lespedeza sericea *Miq.*; *F.B.I.* ii 142, XXXII 1. An erect undershrub with long twiggy branches. Leaflets, linear cuneate, silky. Flowers about ¼ inch, in small fascicles in the axils of the leaves all down the branch. Pod ⅛ inch, round, flattened, thinly silky.

Pulneys: 6,000 to 7,000 feet. *Bourne* 2554.

SMITHIA. F.B.I. 50 XXXVIII.

Herbs with short, pinnate leaves which end in a bristle and have sensitive leaflets, soon closing if plucked. Flowers in axillary racemes, calyx two-lipped. Corolla blue or yellow; keel obtuse. Stamens in two bundles of

five each. Pod jointed, or divided into one-seeded parts, and folded inside the calyx.

Species about 30 in the tropics of the old world.

Calyx with anastomosing veins, flowers all yellow:
Flowers in loose racemes, with filiform peduncles and pedicels. Lfts. 3 pairs . . . . S. gracilis.
Flowers in close racemes: calyx with yellow bristles on black bulbous bases . . . . S. hirsuta.
Flowers in terminal panicles of corymbose racemes, one-sided in fruit; calyx with soft yellow bristles . . . . . S. blanda.

Smithia gracilis *Benth.*; *F.B.I.* ii 150, XXXVIII 6. A diffuse slender perennial plant. Leaflets 4 or 6. Flowers yellow. Calyx strongly ciliated. Pod veined.

Nilgiris and Pulneys, in grass 5,000 to 7,000 feet.

Smithia hirsuta *Dalz.*; *F.B.I.* ii 151 in part. A small herb with short erect stem and trailing branches. Leaflets three pairs, 1/5 to 1/3 inch, wedge-shaped. Branches, petioles and calyx covered with yellow hairs on black bulbous bases; calyx conspicuously so. Flowers 1/3 inch, yellow.

Nilgiris: on the downs in damp places. *Fyson* 6544.

Gen. Dist. Western Ghats 3,000 to 7,000 feet. Eastern Ghats.

Smithia blanda *Wall.*; *F.B.I.* ii 151, XXXVII 12. A tall almost shrubby plant, reaching 2 feet in height. Leaflets 6 to 10. Calyx lips equal, densely clothed with fine bristles. Corolla bright yellow. Joints of fruit 1/12 inch. Wt. Ic. t. 986.

Nilgiris: 4,000 to 6,000 feet. [*G.F.M.P.*]

Gen. Dist. Western Ghats, Mysore to Travancore, East Himalayas.

LEPTODESMIA. F.B.I. 50 XLI.

Diffuse perennial herbs with one or three foliate leaves and small flowers crowded in dense terminal racemose heads, yellow or whitish by the dense hairs on the sepals.

Stamens 9 and 1. Ovary with one ovule only; pod flat, one-seeded, and opening in two membranous valves.

Species two or three only.

Leptodesmia congesta *Benth.*; *F.B.I.* ii 152, XLI 1. Leaves roundish, ¾ inch. Heads of flowers ¼—½ inch.

4,000 to 7,000 feet. *Fyson* 1476, 4423. *Bourne* 2556.

ALYSICARPUS. F.B.I. 50 XLVII.

Herbs with slender stems, with one-foliate leaves, conspicuous stipules, small flowers in terminal racemes; and cylindrical pod constricted between the seeds like a row of beads, which separate into one-seeded, indehiscent parts.

Species about 20, weeds in the tropics.

Alysicarpus racemosus *Benth.*; *F.B.I.* as var of A. belgaumensis, II 60, XLVII 9. A small erect plant with golden pubescence. Upper leaves sometimes three-foliate, lower one-foliate. Leaflet under one inch. Flowers purple, pedicelled in long racemes. Pod of three or four joints, not much exserted from the calyx.

Nilgiris, 3,000 to 7,000 feet.

Gen. Dist. Northern Circars, Deccan, Western Ghats, Nilgiris, Anamalais, etc. [*G.F.M.P.*]

Alysicarpus parviflorus *Dalz.*; *G.F.M.P.*, p. 39, as Desmodium parviflorum, Baker in *F.B.I.* ii 172. t. 314.

DESMODIUM.

See Vol. I p. 114, and also appendix to this volume.

Desmodium rufescens *DC.*; Vol. I p. 115. Flowers purple to deep blue. Pods curved reflexed, in dense spikes below the still open flowers, t. 313.

VICIA.

Vicia sativa *L.*; Vol. I page 117 and II t. 88, but stipules not large, often deep, two-lobed Corolla red, fading blue.

SHUTERIA. F.B.I. 50 LVI.

Slender herbs with pinnately tri-foliate leaves, racemes of flowers, and flat curved pods.

Species under 10, Indian and Tropical Africa.

Shuteria vestita *W. & A.*; *F.B.I.* ii 181, LVI 1. A slender twining herb, with ovate mucronate leaflets, and purplish red flowers. Seeds brown. t. 315.

Nilgiris and Pulneys: 2,000 to 6,000 feet.

Gen. Dist. Sikkim and Khasia to South India and Ceylon.

DUMASIA.

Dumasia villosa *DC.*; Vol. I page 118, t. 316.

PHASEOLUS. VOL. I, P. 119.

Add to the description of the genus, stigma oblique.

Phaseolus sublobatus *Roxb.*; Vol. I p. 119, under name P. trinervius *Heyne*.

Phaseolus calcaratus *Roxb.*; *F.B.I.* ii 203, LXXIII 12. Similar in habit to the last species, but the leaflets 2 to 4 inches broadly ovate, acuminate, scarcely ever lobed, and pods glabrous. Flowers yellow.

Nilgiri and Pulney Hills, to 7,000 feet.

Gen. Dist. Himalayas to Ceylon.

VIGNA. F.B.I. 50 LXXIV.

Twining plants with the characters of Phaseolus but the keel not spirally twisted.

Species about 50.

Vigna vexillata *Benth.*; *F.B.I.* ii 206, LXXIV 5. Leaflets ovate or lanceolate, acute. Flowers 1 inch or more, reddish purple, 2 to 4 together on a long peduncle. Calyx strigosely hirsute. Pod 3 to 4 inches by ¼ inch with blackish hairs, with 10 to 15 seeds.

Nilgiris and Pulney Hills, up to 7,000 feet. [*G.F.M.P.*]

Gen. Dist. Western Ghats, South Kanara, Nilgiris and Pulneys. "Wynaad Sweet Pea."

Vigna wightii *Benth.*; *F.B.I.* ii 206, LXXIV 7. A slender twiner, differing from the last species in the stem being hairy, the calyx softly villous, the petals with shorter claws, the leaflets obtuse mucronate, and the pod with brown hairs.

Pulneys, about 5,000 feet. [*G.F.M.P.*]

Gen. Dist. Western Ghats, Wynaad, etc.

DOLICHOS. F.B.I. 50 LXXVII.

Twining herbs with pinnately three-foliate leaves, and minute sub-persistent bracts, bracteoles and stipules. Differs from Phaseolus in the keel not being spiral, the stigma terminal and the pod flat, slightly curved.

Species about 20, in the tropics of both worlds.

Dolichos lablab is cultivated on the plains for the pods which are eaten green like French Beans. D. biflorus *L.* is cultivated on the plains for its seeds (Horsegram).

Dolichos falcatus *Klein*; *F.B.I.* ii 211, LXXVII 6. A slender twiner. Leaflets entire or slightly three-lobed. Stipules small, reflexed persistent. Flowers lilac or pink in colour, 2 to 8 on slender peduncles of about 2 inches. Calyx under ¼ inch. Corolla twice as long. Pod 2 to 3 inches by ⅜ inch.

"All districts, up to 6,000 feet on the hills." [*G.F.M.P.*]

Gen. Dist. Himalayas to Ceylon.

ATYLOSIA.

Atylosia trinervia *Gamble*; Vol. I p. 120. as A. Candollei *W. & A.* and II, t. 99.

Atylosia rugosa *W. & A.*; Vol. I p. 120. Gamble in *Fl. Mad. Pres.* ii p. 369, describes this as a climbing shrub, but on these hills it is a slender herb running in grass. t. 317.

FLEMINGIA.

Flemingia grahamiana *W. & A.*; Vol. I p. 121, t. **318.**

Flemingia nilgheriensis *Wt.*; Vol. I p. 122 as F. procumbens *var.* nilgheriensis. **t. 319.**

DALBERGIA F.B.I. 50 LXXXVI.

Trees and large woody climbers with pinnate leaves of alternate leathery leaflets, panicles of numerous small flowers, in which the anthers are small and fixed back to back on their filaments and open by a vertical slit; and thin flat indehiscent pods containing one or more seeds, but not winged.

Species about 70, in the tropics.

Dalbergia latifolia *Roxb.* and D. sissoides *Grah.* are the trees whose wood is usually called 'Rosewood' in S. India.

The Indian species were monographed by D. (now Sir David) Prain in the Annals of the Royal Botanic Gardens, Calcutta, Vol. X.

Dalbergia congesta *Roxb.*; *F.B.I.* ii 232, LXXXVI 8, in part. Leaflets 1 by ½ inch, elliptic or obovate, obtuse, notched. Flowers in small cymose panicles, in the leaf-axils, about ¼ inch only. Pod 1 to 2 inches by ¾ inch, with one oblong seed in the middle. *Fyson* 6554.

Nilgiris: On the ghat road below Coonoor, etc.

Dalbergia gardneriana *Benth.*; *F.B.I.* as part of the last. Like D. congesta, but the branches and under sides of leaflets covered with dense brown tomentum, the leaflets elliptic-oblong, not notched and the panicles more contracted.

Nilgiris: Coonoor and just below. *Fyson* 6555.

In the *F.B.I.* these last two species were united.

DERRIS. F.B.I. 50 LXXXIX.

Large climbers with imparipinnate leaves with opposite leaflets and showy panicles of small flowers fascicled along the spike or branches of the panicle.

Calyx teeth very short. Corolla much longer. Pod thin, indehiscent, with a few flat seeds.

Species about 50 in the tropics.

Derris canarensis *Baker*; *F.B.I.* ii 246 and D. oblonga *Benth* Ic. 242. Leaflets about 7, broadly ovate, acuminate, 1½ to 2 inches by 1 inch. Spikes of flowers erect, 3 to 6 inches, three or four together fascicled or on very short peduncles in the leaf-axils, rachis brown. Flowers fascicled. Pedicels about ⅙ inch. Calyx ⅛ inch, brown. Corolla nearly ½ inch longer, white. Standard strongly reflexed; keel obtuse; wings shorter. Pod not seen. t. 320. *Trim. Fl., Ceylon*, t. xxix.

Pulneys: Kodaikānal near the junction of the upper and middle lake roads. *Fyson* 4205.

I name this from the illustration in Trimen's Flora, though the flowers are shown there as pink, for in all other respects it seems to agree with that figure. But if this is correct the species attains a higher elevation than has been supposed, for Gamble in *Fl. M. Pres.* gives its locality as in evergreen forests and along backwaters. It should then probably be considered a highland white flowered form of the species.

SOPHORA.

Sophora glauca *Lesch.*; Vol. I p. 123 and II t. 90. Flowers pink.

CÆSALPINIEÆ.

Vol. I p. 124.

CÆSALPINIA. F.B.I. 50 XCVI.

Trees, shrubs or woody prickly climbers with bipinnate leaves and showy yellow flowers in axillary racemes. Calyx of five almost free sepals, the lowest and largest of which is spoon-shaped. Petals roundish sub-equal with distinct claw. Stamens 10, bent down a little. Pod thin or turgid, dehiscent or not.

Species about 50 in the tropics.

Cæsalpinia pulcherima *Swartz*; the Peacock flower of the Chinese, or Barbados hedge, with large orange red flowers, is almost universal in Madras gardens.

Cæsalpinia sepiaria *Roxb.*; *F.B.I.* ii 256, XCVI 6. A straggling shrub. Branches more or less covered with grey or brown pubescence and small hooked prickles. Leaves 9 to 12 inches long, of 12 to 20 pinnate, each with 16 to 24 leaflets, ½ to 1 inch long, green on the upper side, glaucous on the under. Corolla 1 inch across, pale yellow, facing sideways or down, on ascending pedicels of 1 to 1½ inches. Stamens about ⅝ inch, anthers red. Pod 3 by 1 inch, reddish brown, stout and woody, with a very narrow wing along the upper edge. III, t. **321**.

Nilgiris, below Coonoor on the ghat road. Pulneys, at Vilpatti about 6,500 feet. *Fyson* 4299. *Bourne.*

CASSIA.

See Vol. I p. 125.

Cassia leschenaultiana *DC.* Similar in habit to **C. mimosoides** *Linn.* but with only 16 to 24 pairs of leaflets and the pods hairy, not glabrous. t. **322**.

Nilgiris: Coonoor, etc. Pulneys: Shembaganur, etc.

Cassia didymobotrya *Fres.*; a handsome shrub with large brown bracts under the flowers is grown often in gardens in Coonoor (*C. E. Brown*). Native of Africa.

MIMOSEÆ.

See Vol. I p. 127.

ACACIA.

See Vol. I p. 127.

Acacia longifolia *Willd.*; *Benth. Fl. Australiensis* ii, 397. A shrub or small tree. Branchlets angular, glabrous. Phyllodes very nearly straight, about 3 inches by ¼ inch; nerves 2 or more parallel from the base with reticulations between. Flowers in spikes of about 1 inch, 2 or 3 in an axil. Petals 4. Pod 2 to 4 inches narrow, constricted often between the seeds which lie length-

wise in the pod and have their stalk (funicle) thickened into a short cup-shaped aril. t. 323.

Nilgiris: at Coonoor planted.

Gen. Dist. Native of Australia from Moneton Bay, Queensland, to the Brown River in S. Australia.

ROSACEÆ.

See Vol. I p. 129.

PYGEUM.

Pygeum gardneri *Hook. f.*; Vol. I p. 130. t. 324.

Nilgiris: Coonoor on Lamb's Rk. Rd., etc., 6,000 feet, flowering May. *Fyson.*

PRINSEPIA.

Prinsepia utilis *Royle*; Wt. I p. 467 and II t. 95.

RUBUS.

See Vol. I p. 132, but for the key substitute:

a	Leaves lobed, but not divided	b
	Leaves of three leaflets	R. ellipticus.
	Leaves pinnate of 5 to 7 leaflets	d
b	Bracts pectinately laciniate with linear segments . . .	R. fulvus.
	Bracts laciniate at apex	c
c	Leaves orbicular in outline, tomentum thick, inflorescence dense	R. rugosus.
	Leaves ovate in outline, tomentum short, inflorescence loose	R. fairholmianus.
d	Branches glabrous, not glandular, petals pink; fruit black	R. niveus.
	Branches glandular; petals red; fruit purple	R. racemosus.

Rubus rugosus *Sim.*; *Var.* Thwaitesii; part of R. moluccanus, Vol. I p. 132. Lobes of leaf rounded, sinuses shallow, Vol. II t. 96 *top figure.*

Nilgiris, at high levels.

Rubus fairholmianus *Gard.*; part of R. moluccanus, Vol. I p. 132, II t. 96, *bottom figure.*

Pulneys: 5,000 to 7,000 feet.

Rubus fulvus *Focke.* "A strong growing perhaps climbing species with large spreading flower panicles and black purple fruits. Bracts pectinately laciniate with linear segments. Leaves deeply cordate up to 6 feet diam. Petals nearly as long as the calyx lobes." [*G.F.M.P.*]

Western ghats, W. Nilgiris, Bababudan Hills, etc., 3,000 to 6,000 feet.

Rubus ellipticus *Smith*; Vol. I p. 132 and II t. 97 *upper figure.* This is the commonest Rubus about Coonoor and on the eastern side of the Nilgiri plateau, from Ootacamund and Coonoor to Kotagiri. Flowers white, petals with long claws reflexed between the sepals.

Rubus niveus *Thunb.*; var. subglaber *Thw.* Vol. I p. 135, as Rubus lasciocarpus. "Leaves not white beneath, glabrous except on the nerves; thorns large racemed from broad bases." [*G.F.M.P.*]

Nilgiri and Pulney Hills, at high elevations.

Rubus racemosus *Roxb.*; Vol. I p. 134 and II t. 97 *lower figure* only.

FRAGARIA.

Fragaria indica *Andr.*; Vol. I p. 135. The epicalyx forms a flat plate behind the flower. The brilliant scarlet fruits on their short branches erect from the runners are very conspicuous. Vol. II t. 98, Nilgiri plant. t. 325, Pulney plant.

Under trees. In Kodaikānal a patch on the bank between and near the junction of the Observatory and middle lake roads, flowering June.

Fragaria nilgerrensis *Schlect.*; Vol. I p. 136. Flowers white. Vol. II t. 99, Nilgiri plant. t. 326, Pulney plant.

With both species the Pulney plant appears to have branched peduncles, the Nilgiri plant simple pedicels.

POTENTILLA.

Potentilla leschenaultiana *Ser.*; Vol. I p. 136 and II t. 100. Flowers bright yellow, 3/4 inch across.

ALCHEMILLA.

See Vol. I p. 137.

ROSA.

Rosa leschenaultiana *W. & A.*; Vol. I p. 138 and II t. 101. Flowers white.

Common: growing over the tops of trees in the sholas.

G.F.M.P. gives flowers pink, but I have never seen any but dead white.

Rosa indica *Linn.*; *F.B.I.* ii 364. A large shrub. Leaves glabrous pinnate. Leaf-stalks with very narrow stipular wings at the base. Flowers pink, rather large on long pedicels.

A cultivated plant, wild or run wild near Pykara on the Nilgiris.

Flowers: March and April.

PHOTINIA.

Photinia lindleyana *W. & A.*; Vol. I p. 139 and II t. 102. Leaves sometimes as much as 7½ by 4 inches in *var.* tomentosa *Gamble.* Petioles, undersurface of young leaves and inflorescence softy tawny-tomentose; leaves almost entire serrate towards the apex.

Nilgiris: on the downs, and Coonoor at 6,000 feet.

Photinia notoniana *W. & A.*; Vol. I p. 139. t. 327.

PRINSEPIA.

See Vol. I p. 467.

ERIOBOTRYA. F.B.I. 51 XIX.

Trees with simple, very coriaceous leaves, and white flowers, in pyramidal panicles. Ovary inferior, 2 to 5 celled. Fruit a berry with 2 or 3 seeds.

Species few, in sub-tropical Asia.

Eriobotrya japonica *Lindl.*; *F.B.I.* i 372, XIX 19 Loquat. A fair-sized tree. Leaves very dark-green above on the upper and white tomentose on the lower side. Fruit like a small apple, yellow.

Nilgiris: Planted and common in and about Coonoor and elsewhere on the plateau at 5,000 to 6,000 feet. *Fyson* 696, 2802.

COTONEASTER.

Cotoneaster buxifolia *Wall*; Vol. I p. 141. Young shoots and the undersides of the leaves covered with white hairs, upper surface of leaves glossy. t. 328.

C. microphylla *Wall.*, a species of Kashmir which is sometimes grown in gardens, is distinguished by the dull surface and the flowers solitary.

SAXIFRAGACEÆ.

See Vol. I p. 141, and add under

PARNASSIA.

Parnassia wightiana *Wall.*; Vol. I p. 142. A very handsome species, the flowers over 1 inch across. Stigmas pink, three-lobed. Anthers orange-pink at first, changing one after the other to brown. Capsule surrounded by the five sepals, three-angled, splitting open widely from the top. t. 329.

The anthers at first stand above the stigmas. Later they are reflexed down between the petals and lie each just above a sepal. There they persist after the petals have fallen and until the fruit is nearly ripe.

Parnassia mysorensis *Heyne*; Vol. I p. 142.

The Nilgiri specimens (t. 103-A) have the staminodes more deeply lobed than the Pulney (B).

CRASSULACEÆ.

KALANCHOE.

Kalanchoe grandiflora *W. & A.*; Vol. I p. 144 and II, p. 104. Also in Kodaikānal itself, Flowers February—March.

Bryophyllum pinnatum. See Appendix.

DROSERACEÆ.

See Vol. I p. 145.

HALORRHAGIDACEÆ.

See Vol. I p. 146.

KEY TO THE GENERA.

a { Terrestrial plants with unisexual flowers; the male with four petals, 8 stamens; the female in fruit with one seed . . . . SERPICULA.
Plants of water or wet mud . . . . b }

b { Petals of male 4, stamens 4 . . . . . MYRIOPHYLLUM.
Flowers minute. No petals, but bracteoles 2 . CALLITRICHE. }

SERPICULA.

See Vol. I p. 147, but for S. indica *Thw.* substitute [*G.F.M.P.*]:—

Serpicula brevipes *W. & A.* Glabrous plants with entire or three-toothed, spathulate leaves. Petals acute. Fruit glabrous, ribbed and warted. t. 330.

Nilgiris and Pulneys in wet places, 6,000 to 7,000 feet.

Serpicula hirsuta *W. & A.* Hairy plants, much branched. Leaves obovate, three-toothed. Petals obtuse. Fruit hairy, not ribbed. Wt. Ic. t. 1001.

Nilgiris, 6,000 to 8,000 feet on banks common.

MYRIOPHYLLUM.

Herbs in water or on mud, with narrow whorled or opposite leaves and very small unisexual flowers at the leaf axils. Ovary inferior, four-celled; ovules solitary, pendulous. Fruit separating into 4 or 2 cocci.

Species about 20, in all parts of the world.

Myriophyllum intermedium *DC.*; *F.B.I.* II 433. Leaves 2 or 4 at a node, linear, distantly serrate. Calyx minute. Male petals 4. Stamens 4. Anthers sub-sessile, nearly as long as the petals. Fruit covered with short spines. t. 331. Wt. Ic. t. 1061.

Nilgiris on the plateau, Kotagiri, etc., in wet places. *Fyson* 3879. *Sedgwick* 4604.

CALLITRICHE.

Aquatic glabrous herbs, with opposite narrow leaves and minute unisexual flowers a male and female in the same axil. Bracteoles 2, white, caducous, but no sepals or petals. Male with 1 stamen only. Female with 2 styles and an inferior four-celled ovary; ovules pendulous.

Spices few, all over the world.

Callitriche stagnalis *Scop.*; *F.B.I.* ii 434, V 1. A small weak herb, rooting at the nodes. Leaves oblanceolate or spathulate, ½ inch. Wight Ic. 1917.

Nilgiris and Pulney Hills, in ponds, 7,000 to 8,000 feet. [*G.F.M.P.*]

MYRTACEÆ.

BÆCKEA.

Bæckea virgata *Anders.*; Vol. I p. 148. Australian May (Ooty name) Ti tree of Australia. t. 332.

Another species of the genus is known in Newzealand as Manuka.

EUCALYPTUS.

Eucalyptus globulus *Lab.*; Vol. I p. 149, t. 333.

RHODOMYRTUS.

Rhodomyrtus tomentosa *Wight*; Vol. I p. 150 and II t. 108. Foliage of a grey-green colour, the youngest leaves almost white. Petals pale pink, stamens deeper pink.

SYZYGIUM.

See Vol. I p. 151, under name EUGENIA, and in each species described, for the name EUGENIA substitute SYZYGIUM thus:

Syzygium arnottianum *Wall.* in Vol. I p. 151 and II tt. 109 and 110.

Syzygium montanum *Gamble.* in Vol. I p. 152 and II t. 111.

Syzygium calophyllifolium *Walp.* in Vol. I p. 153 and II t. 112.

Syzygium jambolana *DC.*; *F.B.I.* II 499 VIII 106. Sometimes quite a large spreading tree. Leaves oblong, ovate to lanceolate, obtuse or slightly acuminate, coriaceous, smooth and shiny. Panicles small open with rather widely diverging branches, in the axils of the uppermost leaves. Flowers numerous, ultimately in cymes. Calyx lobes and petals 4, the latter coming off as a cap, white. Stamens white. Fruit purple, variable in size. t. 334.

Nilgiris: Coonoor at 6,000 feet, common; below Kotagiri-Pulneys: below Kodaikānal.

Gen. Dist. Wild and cultivated throughout India, Malaya, Australia.

MELASTOMACEÆ.

See Vol. I p. 154.

KEY TO THE GENERA.

a { Leaves penninerved ; flowers small blue . MEMECYLON.
Leaves 3 or more ribbed from the base ; petals 4 or 5 . b
Flrs. large ; petals 3 pink : herbs . . . . . . SONERILA.

b { Shrubs or herbs with purple showy flowers . . OSBECKIA.
Epiphytic shrubs with small pink or white flowers MEDINILLA.

OSBECKIA.

See Vol. I p. 154, but add: the calyx has, on the mouth between the lobes, appendages bearing tufted bristles.

KEY TO THE SPECIES.

a { Petals 4, red and white. A herb Vol. I p. 155 ; II t. 113. O. cupularis.
Petals 5, purple or pink . . . . , ... b

b { Stem fleshy, glabrous, glaucous . . . . O. sublævis.
Stem hairy c

c { All hairs of calyx simple. Flowers purple . O. lineolata.
Lower hairs of calyx simple, upper tufted . . . . . . d
Calyx hairs in stalked tufts. Branches red with spreading hairs. Vol. I p. 156, II t. 115 O. leschenaultiana
Calyx hairs in broad nearly, sessile tufts. Vol. I p. 157, t. 335.. . . . . O. rectiulata.

d { Flowers, purple, leaves, densely, softy hairy above Vol. I p. 156, II t 114 . . . . . . O. wightiana.
Flowers pink. Leaves sparsly hairy . . Osbeckia, Sp.

Osbeckia lineolata *Gamble.* A shrub, branchlets slender, glabrous, glaucous. Leaves drying yellow, broadly elliptic, three-nerved; nearly smooth but strongly lineolate on the upper surface by the hairs being adnate for nearly their whole lengths. Flowers capitate or racemed purple red. Calyx bristles all simple, except at the tips of the triangular appendages. Capsule ⅓ inch companulate.

Pulneys : near Perumal. *Bourne* 1532.

Gen. Dist. Nilgiris and Pulneys, to 6,000 feet. [*G.F.M.P.*]

Osbeckia sublaevis *Cogn.* "A small fleshy shrub with glabrous glaucous bluish branches and bright purple flowers in small terminal corymbose cymes. Tufts of bristles all sessile. Leaves oblong-lanceolate, 1 to 1½ by ⅓ to ½ inch, three-ribbed lineolate on upper surface, nearly glabrous on lower surface.

Western Ghats from Mysore to Nilgiris, on rocks at about 7,000 feet. [*G.F.M.P.*]

Osbeckia sp.? A small shrub. Branches square, thinly covered with erect hairs. Leaves ovate-lanceolate, three-ribbed. Hairs on upper surface sparse adnate about one-third their lengths, on lower surface slightly adnate. Cymes dense, terminal. Calyx bristles in tufts of 3 or 4, the tufts sessile; appendages linear. Petals about ½ inch pink, with no trace of purple. Anthers hardly attenuate upwards. t. 336.

Nilgiris: at Coonoor on roadsides, common. Flowers, in September. *Fyson*, 5734.
I have not been able to determine the species of this.

MEDINILLA. F.B.I. 60 XVI.

Erect, scandent or epiphytic shrubs. Leaves ribbed from the base. Flowers in terminal panicles or axillary cymes, white or pink, 5 or rarely 6-merous.

Medinilla malabarica *Bedd.*; *F.B.I.* ii 548, XVI 8. An epiphytic sub-scandent shrub. Petioles, bases of the leaves, peduncles and the large flowers all brilliant crimson. Leaves 3 to 3½ inches by 1½ inch, elliptic lanceolate, acute at both ends, thinly fleshy. Flowers 1 to 3 on a peduncle, in axillary fascicles. Petals 4. Anthers short.

Nilgiris: 3,000 to 7,000 feet. Also Anamalais.

SONERILA. F.B.I. 60 X.

Herbs with opposite leaves, 3 to 5 nerved from the base. Flowers in racemes or scorpioid spikes and remarkable

for the parts being all in threes; three short calyx teeth, three showy petals, three stamens with anther-cells slightly divaricate at the base, and a three-celled ovary with single stvle and numerous ovules on axile placentas. Fruit an obovoid capsule opening in three valves.

Species about 60 in tropical India and Malaya. On the Nilgiris and Pulneys they are rare but occasionally met with in cultivation.

The name is taken from the Kanarese.

KEY TO THE SPECIES.

a	Stem erect. Leaves thin, with arching or pinnate nerves.	b.
	Stem erect. Leaves fleshy	c.
	Stem creeping	S. pulneyensis.
	Stemless, leaves orbicular, deeply cordate.	S. rotundifolia.
b	Erect herb, with thick stem and mauve flowers.	S. elegans.
	Undershrub; petals rose coloured, one side darker ...	S. versicolor.
c	Leaves ovate, 7 to 8 ribbed. Calyx glandular.	S. speciosa.
	Leaves, lanceolate, three-ribbed. Calyx glabrous . .	S. grandiflora.

Sonerila speciosia *Zenk.; F.B.I.* ii 534, X 20. Stem nearly or quite glabrous. Leaves petioled, 2 to 3 by 1½ to 2 inches, ovate-acute, finely serrate, with 5 to 9 basal nerves which curve forwards and meet at the apex. Upper flowering portion of the stem hirsute, red, bifurcating cymosely into two one-sided racemes. Calyx tube with much brown hair. Petals ovate-acute, pink. Capsule definitely but lightly six-ribbed. Seeds numerous, with raised points and a large raphe, like a hood at one end. t. 337. Wight. Ic. t. 995-2. Sp. Nilg. t. 67/2.

In moist places, near Avalanche, etc. [*Wight*].

Sonerila grandiflora *Wall.*; *F.B.I.* ii 535, X 21. Stem woody below, round, with numerous prominent leaf-scars. Leaves elliptic, acute at both ends, finely serrate. Flowers crowded in short, one-sided racemes. Calyx

tube glabrous, in fruit funnel shaped. Petals ¾ inch, elliptic acute.

By streams near Sispara, etc. Also Pulney and Anamalai hills, at 6,000 feet.

Sonerila elegans *Wight*; *F.B.I.* ii 535, X 22. Herbaceous. Leaves ovate-acuminate, 2 to 4 inches, penni-nerved. Peduncles terminal, bifurcating cymosely into long one-sided racemes. Petals ½ inch, ovate-acute. Capsule scabrid. Seeds with prominent raised points. Wight Ic. t. 995/3.

Nilgiris : Sispara, 6,000 feet.

Sonerila versicolor *Wt.*; *F.B.I.* ii 535, X 23. Herbaceous. Stem round, slightly ribbed. Leaves ovate-acute, unequal at the base, penni-nerved. Peduncles terminal, racemes one-sided, very short, so that the flowers are nearly umbellate. Petals ⅓ inch, pink, one side darker than the other. [*G.F.M.P.*]

Nilgiris : 3,000 to 6,000 feet below Sispara.

Sonerila rotundifolia *Bedd.*; *F.B.J.* ii 535. A small stemless plant. Leaves round, deeply cordate, up to 1 inch diam. Peduncles bright red, 1½ to 3 inches, with 1 to 4 flowers. Flowers mauve, capsule short hemi-spherical, glabrous.

Nilgiris and Anamalai hills, 4,000 to 6,000 feet.

Sonerila pulneyensis *Gamble*; *Kew Bulletin, 1919, p. 226.* Stem fleshy, creeping, rooting. Leaves fleshy, ovate, with spine-tipped serrations, acute at both ends, ¾ to 2 by ¼ to 1¼ in., with 5 basal nerves. Cymes axillary of 2 to 5 flowers on pedicels ¼ in. long on a common peduncle of 1¼ to 1¾ in. Flowers unknown. Capsule campanulate, ⅓ to 2/5 inch, pale. Seeds surrounded with conspicuous raphe.

Pulneys : in the Pambar Ravine. *Bourne* 1341.

MEMECYLON.

See Vol. I p. 158.

KEY TO THE SPECIES FROM G.F.M.P.

a	Leaves petioled	b.
	Leaves sessile or nearly so	d.
b	Flcwers sessile or slightly pedicelled shrubs.	c.
	Flowers in branched peduncled cymes, Tree.	M. molestum.
c	Leaves green when dry; calyx above the ovary saucer-shaped (Appendix) .	M. lushingtonii.
	Leaves yellowish when dry; calyx campanulate	M. flavescens.
d	Leaves obtuse at apex	M. sisparense.
	Leaves obtusely acute	M. malabaricum.

Memecylon malabaricum *Cogn.*; Vol. I p. 158, as M. amplexicaule. Petals a rich deep blue; calyx pinkish. t. 338.

Nilgiris: 6,000 feet and below. Common near Coonoor, mostly in the shade of large trees. Pulneys at Kodaikānal. *Bourne.*

LYTHRACEÆ.

See Vol. I p. 159.

ROTALA.

Rotala rotundifolia *Kœhne*; see Vol. I page 159, as Ammannia rotundifolia *Ham.* t. 339.

CUPHEA.

An American genus of about 160 species.

Cuphea pinetorum *Benth.* A slender-stemmed sticky plant, with red tubular drooping flowers remarkable for a pair of round black petals which fold back erect from the narrow mouth of the crimson coloured calyx. All young parts, pedicels and calyx glandular-pubescent. Leaves narrow lanceolate, ½ to 2 inches long, with mid-rib and nerves impressed on the upper side. Flowers on pedicels of ½ inch, in axillary

fascicles, forming compound leafy racemes. Calyx ¾ to 1 in., widest at the base, and prolonged below in a short sac; teeth small. Petals 4; 2 lower small red; 2 upper ⅙ inch across black, round stamens 8, inserted inside the calyx and a little below the mouth. Ovary free at the base of the calyx, four-celled, with one style and small stigma. Fruits ½ inch with seeds in four rows on an axile placenta which bursts through the calyx when ripe. t. 340.

Coonoor, Kotagiri, etc., as a garden escape on road sides, under hedges.

ONAGRACEÆ.

See Vol. I p. 161.

ŒNOTHERA.

Œnothera rosea Ait.; Vol. I p. 151. t. 341.

CIRCÆA.

Circæa alpina *L.*; Vol. I p. 161. t. 342.

SAMYDACEÆ.

Casearia coriacea *Thw.*; Vol. I p. 162, as C. esculenta.

PASSIFLORACEÆ.

See Vol. I p. 163.

TACSONIA.

Similar to PASSIFLORIA, but the calyx tube very long.

Native of America. Tacso is a Peruvian name.

Tacsonia mollissima. H. B. & K. A climber with deeply lobed toothed leaves velvetty to the touch. Calyx tube 3 to 5 inches, with 3 united bracts at the base. Sepals and petals pink, 1½ inch. t. 343.

A native of Peru, sometimes grown in gardens.

CUCURBITACEÆ.

See Vol. I p. 165.

KEY TO THE GENERA.

Anther cells doubled back	TRICHOSANTHES.
Anther cells straight, horizontal	MELOTHRIA.
Anthers straight, vertical. Ls. pedate . .	GYMNOSTEMMA.

TRICHOSANTHES. F.B.I. 65 II.

Herbs distinguished from all others of this order very easily by the petals, which are deeply cut into long fimbriæ. Anther cells doubled back. Fruit smooth.

Species 42, India, Malaya, Australia. T. Anguina *Linn.* is the Snake Gourd of the plains.

Trichosanthes villosula *Cogn.* A stout climber with very hairy stems and large white flowers. Male racemes with small bracts. Fruit ovoid-acuminate, 2½ inches long.

Nilgiris: 5,000 to 6,000 feet.

T. palmata *Roxb.*; *var.* tomentosa *Heyne.* *F.B.I.* ii 606, II. Male racemes with large laciniate bracts. Ls· scabrid.

Nilgiris, 3,000 to 6,000 feet. [*G.F.M.P.*]

MELOTHRIA.

See Vol. I p. 166, add:

Melothria leiosperma *Cogn.*; *F.B.I.* ii 623, as Mukia leiosperma *Wt.* A scabrid climbing herb with un-branched tendrills. Leaves angular, not deeply lobed. Flowers small, solitary. Corolla five-lobed. Stamens of male flowers 3, anthers straight two 2-celled, one 1-celled. Female flowers like the male, small campanulate. Fruit globose, green with white markings, seeds few. t. 344.

Nilgiris: near Coonoor, etc. Pulneys at Shembaganur.

GYMNOSTEMMA. F.B.I. II 633, 28 I.

A genus of one or few species.

Gymnostemma pedata *Blume.*; *F.B.I.* ii 633, XXVII I. A slender climber with simple tendrils and pedately compound leaves. Leaflets ovate-lanceolate. Flowers minute, in diffuse axillary panicles, 3 to 6 inches long, greenish. Male and female corolla both rotate, 5 partite. Stamens 5, united below; the anthers straight 2-celled (i.e., normal). Fruit ⅙ inch diam., greenish, 1 to 3-seeded.

Nilgiris, 4,000 to 6,000 feet [*G.F.M.P.*]

Gen. Dist. Eastern Himalayas to Ceylon, Malaya and Japan.

BEGONIACEÆ.

BEGONIA. F.B.I. 65.

Only genus.

Succulent herbs or undershrubs with alternate, asymmetrical and toothed or lobed leaves. Flowers unisexual, monœcious, usually pink or white, showy, in peduncled dichotomous cymes. Perianth of two outer coloured sepals with or without two inner smaller petals. Male flowers: stamens numerous, the filaments free or connate. Female flowers: ovary inferior 3-celled and 3-winged. Fruit a 3-winged capsule with numerous small seeds.

Species about 400 nearly all in the one genus.

Begonia malabarica *Lamk.*; *F.B.I.* ii 653, I 64. Almost shrubby. Leaves cordate, very unequal-sided. Flowers rose-coloured, no petals in male. Capsule ¾ inch long and broad, the wings unequal.

Pulneys: at foot of Silver Castle, etc., Nilgiris.

Gen. Dist. Western Ghats, to 6,000 feet.

UMBELLIFERÆ.

HYDROCOTYLE.

See Vol. I p. 167, but exclude H. asiatica, and add to the description of the genus, 'mericarps with 3 ridges.'

Hydrocotyle conferta *Wt.* Fruits quite sessile.

Grows in swampy ground.

Hydrocotyle rotundifolia *Roxb.* Vol. I p. 168. t. 345.

CENTELLA.

A genus separated from HYDROCOTYLE because the mericarps have 7 or 9 nearly equal ridges.

Centella asiatica *Urban*; see Vol. I p. 168, under name Hydrocotyle asiatica. t. 346.

SANICULA.

Sanicula europæa *Linn.*; Vol. I p. 169. t. 347.

BUPLEURUM.

See Vol. I p. 170.

Bupleurum mucronatum *W. & A.*; Vol. I p. 171, but exclude var. *** virgatum.

Bupleurum virgatum *W. & A.*; Vol. I p. 171 as var. of last species. Umbels long-peduncled.

CARUM.

Herbs with pinnate or much divided leaves. Umbels compound, with no bracts but numerous bracteoles. Flowers white. Fruit more or less oblong, narrowest at the commisure, the mericarps 5-angled.

Species about 60 in temperate climates.

Several are cultivated. C. Petroselium is Parsley. From the mericarps of C. copticum is prepared Omum water, and the antiseptic crystalline substance Thymol. The mericarps of C. carui are known as caraway seeds.

Carum nothum *C. B. Clarke*; *F.B.I.* ii 681, XI 3. A bulbous rooted herb, up to 1 foot in height. Leaves 2 to 3-pinnate, ultimate segments linear, short. Fruit strongly ridged.

Nilgiris : on rocks above Sispara, at 7,500 feet. [*G.F.M.P.*]
Gen. Dist. Also Mysore.

PIMPINELLA.

Pimpinella leschenaultii *DC.*; Vol. I p. 173, the ** Nilgiri form only.

Pimpinella pulneyensis *Gamble*; Vol. I p. 173, as Pimpinella Leschenaultii (*) Pulney form.

HERACLEUM.

Heracleum hookerianum *W. & A.*; Vol. I p. 175. Lower leaves simple, 3-lobed. Petals white, pink on the back. Mericarps with 3 vittæ on the outer side, 2 only in the inner. Not a young form of H. rigens *Wall.*

Heracleum rigens *Wall.*; Vol. I p. 74. t. 348.

Heracleum ceylanicum *Gardner*; Vol. I p. 175. Queen Annes Lace. Flowers pure white. t. 349.

Abundant on the Pulneys in moist valleys and by streams, as soon as the rains begin.

Heracleum sprengelianum *W. & A.*; Vol. I p. 175.

Flowers yellow or greenish yellow. Exclude var.* ligustifolium. t. 350.

ARALIACEÆ.

See Vol. I p. 177, but *for* HEPTAPLEURUM AND BRASSAIA now *read* SCHEFFLERA and *for* the key to the genera *substitute* :

Leaves pinnate, pedicels jointed at the flower . PENTAPANAX.
Ls. digitate, pedicels not jointed below flr. . . SCHEFFLERA.

PENTAPANAX.

Climbers with pinnate leaves of 5 to 9 leaflets. Flowers in umbels, which are in simple or compound racemes. Pedicels jointed just below the flowers.

Species few in India only.

Pentapanax leschenaultii *Seem.*; *F.B.I.* ii p. 724, II 4. A climbing shrub with large pinnate leaves. Leaflets usually 5, 3 to 5 by 2 to 3 inches, ovate-acute, with fine bristle-tipped serration from base to apex, glabrous. Main branches of panicle 2 to 4 inches, again branched or simple. Umbels perfect, pedicels ½ inch, jointed just below the flower. Fruits globose, ⅙ inch, with persistent style; deciduous from the flat slightly expanded end of the pedicel.

Nilgiris: in sholas on the western side, to 7,000 feet. *Fyson* 1921, 2453.

Gen. Dist. Also Sikkim and Burma.

SCHEFFLERA.

Comprising both HEPTAPLEURUM and BRASSAIA of *F.B.I.* and of Vol. I.

KEY TO THE SPECIES.

a { Flowers racemed along the branches of a large panicle . . . . (Vol. I p. 178. t. 351). . . S. racemosa.
Fls. in umbels along a simple raceme. S. wallichianum.
Flowers in umbels on branches of a panicle . . . . . b.

b { Leaflets obtuse, venation very distinct. . . S. stellata.
Leaflets acute, toothed, venation obscure. Vol. I p. 178. S. rostratum.

Schefflera stellata *Harms.*; *F.B.I.* ii p. 730, VII 9. A fair sized tree. Leaflets obovate or roundish, very obtuse; tertiary veins when dry very distinct. Flowers white. Branches of panicle numerous and slender. Styles short and not projecting on the fruit. t. 352. Wight Ic. tt. 1011, 1012.

Nilgiris: at 5,500 feet and below, end of Lamb's Rock Rd., etc. *Fyson* 6411.

Gen. Dist. S. India and Ceylon, to 3,000 feet.
Very closely allied to S. venulosum *Harms*, which is common at 3,000 feet on the Western Ghats in Mysore, etc., and differs in the acute-ovate leaflets.

Schefflera wallichiana *Harms*; *F.B.I.* ii p. 730 VII 11. A large tree, with large pedate leaves, the main rachis up to 18 inches long. Leaflets very thick, 6 to 12 inches by 2½ to 4 inches, oblong-acute, with nearly horizontal base. Umbels on peduncles of 1 to 1½ inches, in racemes of 12 to 15 inches. Pedicels ⅓ inch. Buds glabrous, ⅙ inch.

Nilgiris: 4,000 to 6,000 feet, *F.B.I.* Western Ghats at 3,000 feet. *Fyson* 1595.

Gen. Dist. South Deccan and Ceylon.

Schefflera capitata *Harms*. See Vol. I p. 179, and II t. 131, under generic name BRASSAIA.

CAPRIFOLIACEÆ.

See Vol. I p. 180.

VIBURNUM.

Viburnum acuminatum *DC*. or **V. punctatum** *Ham. var* **acuminata**, Vol. I p. 180. Fruits red, whole panicle drooping when ripe.

Viburnum coriaceum *Blume, var* **capitellata**; Vol. I p. 181. Leaves bright green, drooping. Stamens exserted. Fruits black erect. t. 353.

Common below Coonoor on the ghat road at 5,300 ft.

Viburnum erubescens *Wall., var* **wightiana**, Vol. I p. 182. Leaves stiff as in the English Wayfaring tree. Fruits cylindrical, with smooth shining skin. t. 354.

RUBIACEÆ.

See Vol. I p. 185, but *for* the KEY TO THE GENERA *substitute:*

a	Leaves six at a node: stem slender	GALIUM.
	Leaves four at a node, heart-shaped, stalked	RUBIA.
	Leaves three at a node; fl. in large terminal panicles	WENDLANDIA.
	Leaves two only at a node	b
b	Flrs. in terminal cymose corymbs or panicles	g
	Flrs. axillary, few or many, white	c
c	Herbs	d
	Shrubs	e
d	Flowers sessile	SPERMACOCE.
	Flowers pedicelled or in peduncled umbels.	OLDENLANDIA.
e	Leaves fetid. Corolla hairy at the throat	LASIANTHUS.
	Leaves not fetid. Fruit fleshy with 2 stones	f
f	Corolla valvate in bud	CANTHIUM.
	Corolla twisted.	COFFEA.
g	Lobes of corolla valvate in bud: herbs and shrubs	h
	Lobes of corolla twisted in bud: shrubs	k
h	Herbs: flowers pink blue mauve or white	i
	Shrubs: flowers orange, one sepal enlarged like a white leaf	MUSSÆNDA.
	Shrubs: flowers white, or tinged with mauve	i
i	Stem and leaves very slender	OLDENLANDIA.
	Leaves fetid: seeds 1 or many: flrs. pink or white	ANOTIS.
	Ovules 2 only, with cap at upper end: flowers usually blue.	KNOXIA.
j	Capsule small: flrs. white or tinged with mauve	HEDYOTIS.
	Capsule 1 in. long; petals ciliate: tree	CINCHONA.
	Capsule flat opening by a broad terminal mouth	OPHIORRHIZA.
	Fruit a black berry: flrs. white: style short	PSYCHOTRIA.
k	Flowers pink, tube slender: anthers linear: stigmas separate	IXORA.
	Flowers white: stipules and lower bracts tubular: style very long (Vol. I p. 195 and t. 365)	PAVETTA.
	Flowers white, stout: stigma long, undivided (Vol. I p. 191 and t. 361)	WEBERA.

CINCHONA.

Trees or shrubs with petioled elliptic or lanceolate leaves, and the interpetiolar stipules glandular inside.

Flowers rose or yellowish-white, in dense or open cymose panicles peduncled in the upper leaf axils or terminal. Calyx small with 5 teeth. Corolla tubular below, with 5 spreading lobes very hairy on the margins. Anthers linear attached to the middle of the tube. Fruit a capsule splitting open from the base upwards. Seeds numerous.

Species about 30 in the Andes of South America.

The two commonest species planted and found scattered in hedges, etc., are—

C. ledgeriana *Moens ;* "Yellow bark." Leaves small, elliptic, rather leathery, and red underneath. Flowers golden. Capsule short, almost globular. This is the one richest in the alkaloid from which quinine is prepared.

C. succirubra *Pav. ;* "Red bark." Leaves thin up to 12 by 9 inches, calyx and corolla red. Capsule long.

WENDLANDIA. F.B.I. 75 XII.

Shrubs or small trees. Leaves opposite or in threes. Flowers small in dense thyrsoid terminal panicles, white or rosy. Calyx small. Corolla funnel-shaped with 4 or 5 spreading lobes, inbricate in bud. Stamens as many. Ovary interior two-celled. Fruit, a small round capsule, with many seeds.

Species about 20 in tropical Asia.

Wendlandia notoniana *Wall.*, *F.B.I.* iii 40, XII 11. Sometimes only a herb, but also with thick woody base, and even a small tree. Leaves three at a node, 3 to 5 by 1 to 2 in., entire, glabrous on the upper side, pubescent on the lower; with 6 to 10 pairs of nerves and fine reticulation between. Panicle, and young parts generally, pubescent. Flowers white or pinkish. t. 355.

On the lower downs, about 6,000 feet, common.

Nilgiris: Pykara, Coonoor, etc., Pulneys: Shembaganur.

HEDYOTIS.

Hedyotis stylosa *Br.*; Vol. I p. 187. Buds lilac. Flowers very pale lilac.

Hedyotis swertioides. *Hk. f.;* Vol. I p. 188, t. 356.

Hedyotis verticillaris, *W. & A.*; Vol. I p. 188. Flowers blue or violet.

Nilgiris: in moist ground, upper Pykara valley, Flr. May.

OLDENLANDIA.

Small herbs with slender bifurcating branches, small narrow leaves, and small white flowers in axillary or terminal cymes. Calyx usually four lobed, the teeth well separated in fruit. Corolla valvate in bud. Ovary two celled. Capsule small protruding, and opening loculicidally above the calyx. Seeds small, angled.

Species perhaps 100 especially in tropical and subtropical Asia.

Flowers solitary, branches very slender . . . O. heynei.
Flowers umbelled . . . . O. umbellata.

Oldenlandia heynei, *Br.*; *F.B.I.* iii 65, XXI 3. All parts very slender. Peduncles axillary ½ in one flowered. Corolla tube short, capsule 1/10 in., its crown much protruded. Seeds smooth. t. 357.

On the plateaus common. Pulneys flowering before June. *Fyson* Nos. 460, 652, 4160.

Oldenlandia umbellata *Linn.*; *F.B.I.* iii 66, XXX 5. Leaves fascicled, flat or almost needle-like. Flowers in small umbels, on axillary peduncles. Corolla tube short. Fruit 1/12 in., crown of ovary low. Pres. Coll. Bot. Bull. No. 6.

Nilgiris: Coonoor, a weed from the plains. *Fyson* 723, 5631.

Gen. Dist. South India, Burma, Ceylon.

ANOTIS.

See Vol. I p. 188.

Anotis longiflora *Hutchinson* ; *Kew. Bulletin* 1916, p. 35. This appears to be the Anotis sp. described in Vol. I, p. 189 and illustrated in II t. 140. By a misprint the calyx is described (p. 189) as ½ in, it should have been 1/12 in.

Anotis wightiana *Hook.f.* ; *F.B.I.* iii 75, XXII 16. A small weak herb with stem 2 to 8 in. all green parts covered with soft hairs. Leaves ovate or elliptic, acute, sessile or nearly so. Flowers in small terminal cymes with a pair of leaves just below. Calyx tube 1/12 in., lobes ciliate. Corolla ⅛ in. long and wide, 3 or 4 lobed, usually white but also pink or blue. Fruit roundish, usually with 2 seeds also with 3 or 4, rugose when dry. t. 358.

Nilgiris : Coonoor, Pykara, Ootacamund. *Fyson* 690, 4176, 6331.

Gen. Dist. Nepal to Khasia, mountains of South India, Malaya, China.

Anotis monosperma *Hk. f.* ; Vol. I p. 190. t. 359.

OPHIORRHIZA.

See Vol. I p. 191.

Corolla ⅓ in., glabrous . . . . O. Brunonis.
Corolla 1 in., hairy . . . . O. Roxburghiana.

Ophiorrhiza brunonis, *W. & A.* ; Vol. I p. 191. Very common in sholas of medium density near Coonoor. Flowers May. t. 360. *Fyson.* 6392.

Ophiorrhiza roxburghiana *Wt.* ; *F.B.I.* iii 81, XXV 15. Leaves oblong, ovate or obovate, shortly acuminate narrowed at the base at the short stalk, glabrous on the upperside, puberous on the nerves of the lower. Bracteoles linear. Corolla tube 1 in., funnel-shaped, yellow, hairy. Capsule hairy.

Pulneys : Kodaikānal sholas, at 7,000 feet. Flr. May. *Fyson* 382, 1109.

MUSSAENDA. F.B.I. 75 XXIX.

Shrubs of the usual rubiaceous type, and distinguished among all ours by the large white or yellow leaf-like sepal, against each flower. Corolla valvate. Ovary two-celled. Fruit a many-seeded berry.

Species about 50, in tropical Africa, Asia and Polynesia.

Mussaenda frondosa *Linn.*; *F.B.I.* iii 89, XXIX 9. *var.* hirsutissma. Very hairy all over. Leaves ovate acute shortly stalked, 2 to 4 in. Calyx lobe (sepal) as large, white. Corolla tube 1¼ to 1½, limb stellate, orange-brown, 1 inch across, with lighter very hairy mouth.

Abundant on the lower slopes up to 6,000 feet. *Fyson* 305, 645, 1428.

Gen. Dist. From Nepal to South India, and to Malaya.

WEBERA.

Webera corymbosa *Willd.*; Vol. I p. 191. t. 361.

KNOXIA.

See Vol. I p. 192.

Knoxia mollis *W. & A.*; Vol. I p. 193. t. 362.

Knoxia wightiana *Wall.*; Vol. I p. 193. t. 363.

CANTHIUM. F.B.I. LXIII

Shrubs and trees, sometimes spiny, with entire opposite leaves, short triangular combined stipules, and small flowers in axillary fascicles or corymbose cymes. Corolla white with a ring of re-flexed hairs inside; lobes valvate. Stamens on the mouth of the corolla. Fruit globose or two-lobed, with one stone in each cell; embryo long, with short cotyledon and radicle pointing upwards.

Species about 70, in the tropics of the old world.

KEY TO THE SPECIES.

Flowers in dense peduncled umbels; ruit ¼ inch; leaves thick	C. umbellatum.
Flowers few; fruit ¾ inch; leaves thin . .	C. neilgherrensis.

Canthium neilgherrensis *Wt.*; *F.B.I.* iii 133, LXII 4. Not spiny. Leaves elliptic 3 to 4 by 1½ to 2 inches, pubescent underneath; petioles short. Fascicles of flowers very shortly peduncled. Fruit ¾ inch obovoid, showing the double stone, and crowned by the scarcely perceptible calyx. t. 364. Wight Ic. t. 1064.

Nilgiris: Kotagiri in Longwood shola, 6,500 feet. 'Droog' under moderate shade 5,300 feet. Flowers early in the year. *Fyson* 6242. *Sedgwick* 1447.

Gen. Dist. Nilgiri and Pulneys Hills.

Canthium umbellatum *Wight*; *F.B.I.* iii 132, LXII 3. A fair-sized tree. Leaves very coriaceous, 4 by 2 inches, on very short stalks, elliptic, shortly acuminate, shining on the upper side, perfectly glabrous. Flowers in shortly peduncled dense cymose umbels. Pedicels about 1 inch. Fruit ¼ to ⅓ inch, obovoid, with two stones, but not didymous.

Nilgiris, below Coonoor.

Gen. Dist. W. Ghats.

IXORA.

Ixora notoniana *Wall.*; Vol. I p. 194 and II t. 142, abundant at Coonoor.

PAVETTA.

Pavetta breviflora *DC.*; Vol. I p. 195. Nerves well impressed on the upper side, and dotted with large glands. Stigma notched. t. 365.

PSYCHOTRIA.

See Vol. I p. 195.

Psychotria congesta *W. & A.*; Vol. I p. 196.

There appear to be two distinct forms. At high levels, e.g., Dodabetta 8,000 to 8,600 feet and on the Pulneys at 7,500 feet, the leaves are large and the fruit has only one round seed. At lower levels about 7,000

feet, the leaves are only 2 to 3 inches long and the fruit invariably has two plano-convex seeds. t. 366.

Psychotria elongata *Wight*; *F.B.I.* iii 163, LXXV 10. A shrub of the sholas with nearly elliptic, opposite leaves, impressed on the upper side with 13 or so very regularly placed pairs of nerves with perforations at the axils, and small white flowered cymes in erect terminal spikes subtended at the base by two very large stipules which form a divided tube, ½ inch long. Whole plant quite glabrous, branches smooth and shining. Stipules early caducous. Calyx obsolete. Corolla tube ⅛ inch lobes shorter, spreading; throat hairy. Stamens erect, filaments white. Fruit ⅓ inch diameter. Seeds two, flat on the inner face. Endosperm ruminate. t. 367. Wight Ic. t. 1036.

Nilgiris at 5,000 feet in dark sholas. Also near Coonoor, 6,000 feet under light shade but appears not to fruit well there. *Fyson* 6266.

Psychotria bisulcata *W & A.*; Vol. I p. 197. t. 368.

Nilgiris: Kotagiri in large sholas. Coonoor under light shade, of Elæocarpus oblongus, etc. *Fyson* 6392 (figure).

LASIANTHUS.

See Vol. I p. 197.

Lasianthus coffeoides *Fyson*; Vol. I p. 199. t. 369. Apparently only on the Pulneys.

Lasianthus strigillosus *Hook. f.*; *F.B.I.* iii 185, LXXIX 26. Shrub, moderately branched. Leaves similar in shape but smaller than in L. coffeoides, with 4 or 5 pairs of nerves, and very numerous, very faint cross nerves: drying gray. Cymes sessile. Flowers white. Fruit ¼ inch diameter, black.

Nilgiris: Coonoor, under the dense shade of Hydnocarpus alpinus at 6,000 feet, etc.

SPERMACOCE. F.B.I. 75 LXXXVII.

Herbs with square branches, stipules connate into a broad tube with marginal bristles, and small flowers in axillary or terminal fascicles: and characterised further by the corolla lobes valvate in bud, and the fruit dividing into two 1-seeded parts.

Species about 150 tropical and subtropical.

Spermacoce ocymoides *Burm.*; *F.B.I.* iii 200, LXXXVII 2. Very variable. Branches numerous weak or prostrate, forming in dry places a dense tuft. Leaves close or distant according to situation, ¼–1½ inches by ⅙–½ inch, more or less acute at both ends sub-sessile or petioled. Corolla white small, hairy at the throat, four lobed. Fruit surmounted by the four spreading sepals, and splitting into two parts in which open along the inner faces. Seeds narrow ellipsoid. t. **370.**

Pulneys: slopes of the Shembaganur valley, etc., 5,000 to 6,000 feet. In grass.

Kukal, 7,000 feet. Nilgiris: Coonoor. *Fyson* 4170, 4308, 5662. *Bourne* 2601.

GALIUM.

Galium rotundifolium *L.*; Vol. I p. 201. Flowers yellow. t. **371.**

Galium asperifolium *Wall.*; Vol. I p. 201. t. **372.**

VALERIANACEÆ.

VALERIANA.

See Vol. I p. 372.

Valeriana hookeriana *W. & A.*; Vol. I p. 203. t. **373.**

Valeriana beddomei *C. B. Clarke*; Vol. I p. 203. On the higher downs of the Pulneys glabrous and hairy forms occur side by side.

COMPOSITÆ.

VERNONIA.

See Vol. I p. 214, but add to the species:

Vernonia fysoni *Calder*; *Rec. Bot. Surv. Ind. VI* 343 *& t. X.* A weak-stemmed straggling or climbing shrub. Stem and branches terete whitish, slender. Leaf-stalk ½ inch. Leaves elliptic-lanceolate, acute, dark green on the upper surface, densely covered on the under with white tomentum, as on the branches and petioles: margins finely serrate, the teeth about 1/16 inch apart, often curled down and liable therefore to be overlooked. Panicle terminal, its branches repeatedly forked, not spreading but sub-erect. Heads small, twice as long, 1/5 inch, as broad, egg-shaped. Bracts with purple tips. Flowers pale purple. Achene with ten shallow ribs, minutely scabrid; pappus projecting 1/5 inch beyond the involucre. t. **374.**

Pulneys: at 7,000 feet in light sholas near Kodaikanal. *Fyson* 4095.

Vernonia *sp. nov.* Not much branched. Leaves elliptic, acute at both ends, 4 by 2 inches, with bristle teeth 1/6 to 1/5 inch apart. Heads ½ to ¾ inch wide, in terminal corymbs. Involucral bracts imbricate, spine tipped. Achenes ⅛ to ⅙ inch, ten-ribbed, glabrous. Pappus twice as long dirty white. t. **377.**

Pulneys: Shembaganur hill side near Kodai. Flr. March and April. *Fyson* 4130, 4057.

This is returned to me by Kew as near V. Lobbii.

Vernonia peninsularis *Clarke;* Vol. I p. 214. t. **375.**

Vernonia bourneana *Smith*; Vol. I p. 216 and II t. 150, under name V. comorinensis.

Vernonia saligna *DC.*; *F.B.I.* iii 235, V 21. A herb with woody stem, branched upwards. Young parts covered with dense tomentum. Leaves elliptic, acute at both ends, 1/12 by ¾ inch, serrate. Heads numerous

¼ inch wide or less, in branched rounded corymbs. Bracts acute with strong mid-rib but hardly aristate, scarious with purple tips. Achenes 1/12 inch; ribs 5, glabrous. Pappus three times as long. t. 376.

Pulneys: downs just below Kodaikānal, towards Vilpatti, etc. *Fyson* 4087, 5027, 4193.

Gen. Dist. Nepal to Burma and the Pulneys.

ADENOSTEMMA.

Adenostemma viscosum *Forst*; Vol. I p. 218, II t. 153. Florets small, purplish, hardly seen, but styles white, long and flat, like ligules making whole head white. Branches of panicles weak, divergent.

EUPATORIUM.

Eupatorium glandulosum *H.B. & K.*; Vol. I p. 220. Unknown in Ootacamund I am told twenty-five years ago, and introduced as a garden plant. Now abundant and a serious pest. The last few years have seen it well established on road sides for a considerable distance down the Seegur Ghat and along the Coonoor-Kotagiri and the Kotagiri-Kodanad Roads as far as the forking to Mettupalaiyam (1919). Special by-laws have been passed for its extermination under the name of the preceding species.

Eupatorium odoratum *Linn.* A herb 12 inches high with thin stem and widely diverging branches. Leaves triangular-ovate, entire at the apex, coarsely toothed at the base, three-nerved. Heads in corymbs terminating the branches, cylindrical, florets about 20. Involucral bracts, imbricate, obtuse, strongly three-nerved.

Ootacamund, a garden introduction.

DICHROCEPHALA.

See Vol. I p. 220.

MYRIACTIS.

Myriactis wightii *DC.*; Vol. I p. 222 and II t. 158. A wood-land plant. Heads at first white, turning purple. Terminal head opening first.

ERIGERON.

See Vol. I p. 222.

Erigeron linifolius *Willd.*; *F.B.I.* iii 254. Branched or not, 12 to 24 inches. Leaves narrow, linear to oblanceolate 1 to 2 inches by 1/16 to ¼ inch, the broader ones very coarsely serrated, erect or weakly spreading. Heads on peduncles of ½ to ¾ inch, in terminal racemes or panicles. Involucral bracts 1/6 to 1/5 inch linear, coarsely hairy. Florets small purplish. Achenes 1/20 inch; pappus 1/16 inch reddish. t. 378.

A weed, on both plateaus. *Fyson* 1952, 4216, 4313. *Beurne* 4468.

Erigeron mucronatum *DC.*; Vol. I p. 222. t. 379.

CONYZA.

See Vol. I p. 224.

Conyza stricta *Willd.*; Vol. I p. 124. t. 380.

Conyza japonica *Less.*; *F.B.I.* iii 256, XXIV 2. Stem 6 to 12 inches, woody or glabrate, not or little branched. Leaves sessile, obovate, spathulate, coarsely serrate, often but not always with dilated auricular base. Heads ⅓ inch diameter nearly sessile in terminal rounded corymbs. Involucral bracts acute, with hairy middle part and scarious margins. Receptacle pitted and fimbriate. Achenes very small, pinkish purple. Pappus ¼ inch silky, slightly red or pinkish. t. 381.

On paths and bare places, on both plateaus. *Fyson* 4161. *Sedgwick* 439, 1576.

Has the habit of Blumea hieracifolia, cf. p. 71 of this book.

BLUMEA.

See Vol. I p. 224.

KEY TO THE SPECIES.

Florets yellow. Leaves mostly radical . . B. hieracifolia.
Florets purple, heads numerous, strongly scented . . . B. neilgherrensis.
Florets purple, heads few. Very woolly herbs. Leaves three times as long as broad . . . . B. sp.

Blumea neilgherrensis *Hook. f.*; Vol. I p. 225. This seems to be the hill form of B. wightiana *DC.* differing from it in little except the purple instead of yellow florets. It varies much in habit, being small or large, unbranched or copiously branched. t. 382.

Blumea hieracifolia *DC.*; Vol. I p. 225. t. 383.

Chiefly near water, though not in marshy ground.

Blumea hieracifolia *DC.* var. Whole plant very cottony. Radical leaves if present large up to 3 by 1 inch, obovate, and forming a rosette, but usually absent at times of flowering; stem leaves 2 by ¾ inch oblong, elliptic, acute, with clasping base. Heads in a compact mass or rounded corymbs terminating the stem, and the branches (if any). Florets purple. Achenes five-angled, scabrid on the angles. Pappus white.

Pulneys: in hollow on the downs in semi-swampy ground.

Form 1. Stem 5 to 12 inches. Heads wooly, but lower leaves and stem thinly tomentose. Leaves 2 to 3 by ½ to ¾ inch. t. 384. *Fyson* 422. *Bourne* 1110 probably.

Form 2. Stem 12 to 15 inches. All very woolly. Leaves 2 by ¾ to 1 inch. t. 385. *Fyson* 4344. *Fischer* 2961 fide V. Narayanasawmi (Sibpur).

Form 1 approaches B. hieracifolia *typica*, in which species these plants quoted above are included by both Kew and Calcutta (Sibpur): but both forms differ in the purple not yellow florets, and in the absence almost always of any rosette of leaves. Few people seeing these two growing near Kodaikānal would suspect them of being the same species as B. hieracifolia.

LAGGERA.

See Vol. I p. 226.

Laggera alata *Schultz*: Vol. I p. 226. t. 386.

ANAPHALIS.

See Vol. I p. 227, but add:

Some of the species are very strongly scented; thus A. travancorica and A. aristata both emit a strong odour of curry. A. aristata is most easily distinguished from A. Wightiana by growing in dry places, and flowering in the early months of the year.

Anaphalis notoniana *DC.; F.B.I.* iii 248, XXXIX 17. Distinguished among our species by the broad obtuse involucral bracts. Stem branched from the base, and leafy to the ends of the branches, very woolly. Leaves oblong, obtuse, equally woolly on both ends, one-nerved. Heads crowded at the ends of the branches. Involucral bracts obtuse, erect, glistening yellow or pink, scarious and wrinkled. *Lady Bourne's Ootacamund flowers, p.* 63.

Nilgiris: Dodabetta, Church Hill, Ootacamund, Avalanche. [*E.T.B.*]

Anaphalis marcescens *Clarke; F.B.I.* iii 286, XXXIX 25. Stem slender, twiggy, much branched. Leaves linear ¾ to 1 inch, one-nerved, with strongly revolute margins, glabrous on the upper side, woolly on the under, like the stem. Heads ⅙ inch diameter in rounded terminal corymbs. Bracts glistening white, lanceolate. Wight Ic. t. 1115.

Nilgiris: Kotagiri. Flr. Jan.-Feb. *Clarke.* But *Sedgwick* No. 1483 flr. June.

GNAPHALIUM.

See Vol. I p. 288, and add:

Gnaphalium hypoleucum *DC.; F.B.I.* iii 288, XLII 2. Stem corymbosely branched, cottony or ultimately glabrous. Leaves linear or oblong, with auricled base, flat, the margins not recurved, woolly on the under side, glabrous on the upper. Heads in small rounded masses forming large terminal corymbs. Bracts bright yellow, erect.

Nilgiris: Kotagiri, etc. Pulneys near Kodaikānal. *Sedgwick* 1173. *Fyson* 4361. *Bourne* 349.

Gen. Dist. Throughout India.

Gnaphalium luteo-album *L.*; Vol. I p. 234. t. 387.

CHRYSOGONUM.

Chrysogonum heterophyllum *Benth.*; Vol. I p. 235, t. 388.

Chrysogonum arnottianum *Benth.*; Vol. I p. 235. Rays yellow. Wight Ic. t. 1105.

Nilgiris: on the western downs, Mukartè Peak. *Fyson.*

The large leaves and yellow rays alone distinguish this from the previous species. Probably both are varieties of one.

SIEGESBECKIA.

Siegesbeckia orientalis *Linn.*; Vol. I p. 236, II t. 168.

SPILANTHES. F.B.I. 78 LVIII.

Annual herbs with opposite leaves, and long-stalked globular or conical, often very tall, flower heads, of the tube HELIANTHOIDEÆ (see Vol. I p. 209) achenes without pappus but sometimes with a few bristles.

Species 20 chiefly American.

Spilanthes acmella *Linn.*; *F.B.I.* iii 307, LXXIII 1. Easily distinguished among our COMPOSITÆ by the conical, bright yellow flowers-heads without rays. Stem weak or more or less erect. Leaves triangular ovate, with shallow serrations, three-nerved at the base, pubescent as are all green parts. Peduncles 2 to 4 inches, heads ½ by ¾ inch. Involucral bracts few. Florets all tubular, funnel-shaped, yellow. Achenes compressed, ⅛ inch long, black, contracted below the small terminal areola. t. 389.

Nilgiris: A wayside weed, common, Ootacamund (Sep. etc.). Kotagiri, Coonoor, etc. *Fyson* 4298. *Sedgwick* 1682.

Gen. Dist. Throughout India and all warm countries.

BIDENS.

See Vol. I p. 237.
Bidens humilis *H.B. & K.*; Vol. I p. 237. t. 390.

GALINSOGA.

Galinsoga parviflora *Cav.*; Vol. I p. 237. t. 391.

ARTEMISIA.

See Vol. I p. 238.
Artemisia parviflora *Roxb.*; Vol. I p. 238. t. 392.

GYNURA.

Gynura nitida *DC.*; Vol. I p. 240. Very variable as regards fleshiness and hairiness. t. 393.

EMILIA.

Emilia sonchifolia *Wight*; Vol. I p. 240. t. 394.
Emilia zeylanica *C. B. Clarke*; Vol. I p. 241. t. 395.

NOTONIA.

Notonia walkeri *Clarke*; Vol. I p. 241. t. 396. *Fyson* 6292.

SENECIO.

See Vol. I p. 242.
Senecio zeylanicus *DC.*; Vol. I p. 242. t. 397.
Senecio saxatilis *Wall.*; Vol. I p. 243. t. 398.
Senecio polycephalus *Clarke*; Vol. I p. 244. t. 399

CNICUS.

Cnicus wallichii *DC.*; Vol. I p. 247. t. 400.

PICRIS.

See Vol. I p. 247.

CREPIS.

See Vol. I p. 248.
Crepis japonica *Benth.*; Vol. I p. 248. t. 401.

HYPOCHÆRIS.

Hypochæris glabra *Linn.*; Vol. I p. 250. t. 402.

LACTUCA.

Lactuca hastata *DC.*; Vol. I p. 251. t. 403.

CAMPANULACEÆ.

LOBELIA.

Lobelia trigona *Roxb.*; Vol. I p. 253. t. 404.
Lobelia excelsa *Lesch.*; Vol. I p. 254. t. 405.

WAHLENBERGIA.

Wahlenbergia gracilis *DC.*; Vol. I p. 255, II.t. 175.

CAMPANULA.

See Vol. I p. 255.

Campanula alphonsii *Wall.*; Vol. I p. 256. t. 406.

VACCINIACEÆ.

VACCINIUM.

Vaccinium nilgherrense *Wt.*; Vol. I p. 258. t. 407.

ERICACEÆ.

GAULTHERIA.

Gaultheria fragrantissima *Wall.*; Vol. I p. 259. t. 408.

RHODODENDRON.

See Vol. I p. 261.

MYRSINEÆ.

See Vol. I p. 266.

MÆSA.

Mæsa perrottetiana *DC.*; Vol. I p. 266. t. 409.

Fertile fruit a small green berry. Often a gall with no seeds takes its place, or instead there is often an inflated hollow ovary nearly enclosed in a white fleshy accrescent calyx, with small or aborted seeds, giving the appearance of a white berry.

EMBELIA. F.B.I. 88 III.

See Vol. I p. 267.

Usually climbing shrubs with entire leaves. Flowers in axillary or terminal racemes, small, white or greenish, mostly unisexual and dioecious. Petals nearly free, imbricate. Fruit a small one-seeded berry. Embryo curved.

Species about 100 in the tropics.

Embelia ribes *Burm*; *F.B.I.* iii 513, III 1. A thin stemmed climbing shrub, with glossy leaves all facing upwards. Leaves elliptic-oblong or obovate, with blunt cuspidate apex, quite entire. Panicles terminal and axillary on drooping branches, pubescent with grey hairs. Flowers 1/12 inch, white; pedicels as long or longer. Petals imbricate. Fruit globose, ⅙ inch. t. 410. Wight Ic. t. 1207.

Nilgiris: Coonoor, Wellington, etc., common in sholas. Pulneys: Shembaganur, etc.

Embelia viridiflora *Schff.; F.B.I.* iii 516, III 10. Altogether a more robust plant than the last. Flower bearing branches not drooping. Berries green, orange or red, ⅓ inch. t. 411.

Nilgiris: Wellington, Kotagiri. *Fyson. Sedgwick.*

SAPOTACEÆ.

See Vol. I p. 269 and add:

KEY TO THE GENERA.

Sepals and petals 5. Stamens 5. Staminodes 5. . SIDEROXYLON.

Sepals and petals 4. Stamens 8, all perfect. ISONANDRA.

SIDEROXYLON.

Add under:

Sideroxylon tomentosum *Roxb*; Vol. I p. 269 and II t. 183. Shoots often with long spines.

ISONANDRA. F.B.I. 89 IV.

Trees with alternate, coriaceous glabrous leaves. Flowers small, in axillary clusters. Sepals and petals 4. Stamens 8; no staminodes. Ovary four-celled. Fruit a one-seeded ellipsoid berry.

Species few, in South India and Ceylon.

Isonandra candolleana *Wt.*; *F.B.I.* iii 539, IV 2. Leaves obovate oblong, bluntly acuminate, tapering at the base. t. **412**.

Nilgiris and Pulney hills, on the plateau.

SYMPLOCACEÆ.

See Vol. I p. 271.

Symplocos spicata *Roxb*; Vol. I p. 271. t. **413**.

At Coonoor one of the commonest of the smaller trees. The young leaves are violet in colour.

OLEACEÆ.

See Vol. I p. 274.

JASMINUM.

See Vol. I p. 275.

Jasminum sambac *Ait.*; Vol. I p. 275. t. **414**.

Jasminum bignoniaceum *Wall.*; Vol. I p. 276. t. **415**.

Jasminum rigidum *Zenker*; *F.B.I.* iii 598, 25. A dense shrub with often rather small ovate or elliptic ovate shining leaves. Corolla tube 1¼ inch, longer than the lobes.

Nilgiris: Coonoor at 6,000 feet. *Fyson* 6267, 6392. Kotagiri. *Sedgwick* 1633.

APOCYNACEÆ.

Herbs or trees, with milky juice and opposite leaves, without stipules. Flowers in cymes, axillary or terminal, often clearly dichotomous. Corolla of 5 lobes, twisted in bud. Stamens on the corolla tube with narrow or sagittate anthers. Ovary of 2 free or 2 united carpels, but one style only, with usually a large drum-shaped stigmatic head. Fruit a pair of follicles or a double drupe or berry. Seeds in the follicles often with hairs or wings.

Species about 1,000, all over the world but chiefly in the tropics.

Well-known plants of this order are Vinca major *L.* and Vinca minor *L.*, the Periwinkles of England. And in India: V. rosea *L.* with pink or white flowers, common in sandy gardens; Nerium oleander with single or double pink or white flowers, and Wrightia tinctoria *Br.* with white flowers and pairs of long slender curved black follicles united at the tip. Several others are cultivated in gardens.

CARISSA. F.B.I.

Shrubs sometimes armed with axillary spines. Leaves opposite entire glossy. Flowers axillary. Fruit fleshy.

Carissa paucinervia *A. DC.*; *F.B.I.* iii 631. VI 3. A small ramous shrub, glabrous except the petiole and cymes. Leaves 1 to 1½ inches, elliptic oblong to lanceolate, acute at both ends, coriaceous, not shining, nerves oblique 2 to 3 pairs. Peduncles very short 3-to 5-flowered; corolla ⅙ to ⅓ inch, lobes very narrow, fruits ellipsoidal. t. 416.

Nilgiris: Coonoor, Kotagiri, etc.

RAUWOLFIA. F.B.I. 94 VII.

Shrubs with leaves in whorls of 3 or 4. Corolla salver-shaped with slender tube and constricted mouth. Anthers small, rounded at the base. Carpels distinct. Fruit of two distinct or united drupes, each one-seeded.

Species about 40, chiefly American.

Rauwolfia densiflora *Benth.*; *F.B.I.* iii 633, VII 3. Leaves obovate or oblanceolate, shortly acuminate about 4 by 2 inch, with 8 to 16 regularly disposed pairs of lateral nerves. Flowers white, in much bifurcating corymbose cymes. Corolla tube inflated at the top. t. **417**.

Nilgiris; in light sholas near Coonoor and Kotagiri, common flowering summer months, the white flowers very conspicuous.

ASCLEPIADACEÆ.

See Vol. I p. 281, and add:

BRACHYLEPIS. F.B.I. 95 IV.

Brachylepis nervosa *W. & A.; F.B.I.* iv 7, IV 1. A fairly, stout climbing shrub, pubescent on the young parts. Leaves broadly elliptic or ovate, about 3 by 2 inches, coriaceous, dark green, glabrous and glossy on the upper side. Flowers 1/6 inch diameter greenish outside, purplish inside; in terminal or axillary dichotomous cymes. Coronal scales broad. Pollen masses two in each cell (20 in all) granular. t. **418**.

Nilgiris: Kotagiri, Wellington, etc.

Gen. Dist. Only these hills.

CYNANCHUM. F.B.I. 95 XXVI.

Twining plants with rather slender stems, opposite leaves, and small greenish flowers, in which the corona is in the form of a white wavy cup, and the pollen masses are solitary in their cells (10 in all) and pendulous (the translator being at the top).

Species about 100.

Cynanchum alatum *W. & A.; F.B.I.* iv 23, XXVI 5. Leaves nearly oblong, cordate, acute glabrous. Peduncles of umbels 1/6 inch; pedicels 1/3 inch. Pod 1½ to 2 inches. t. **419**.

On both plateaus, not uncommon. *Fyson* 3545, 3127.

SARCOSTEMMA. F.B.I. 95 XXVII.

Leafless plants with thin cylindrical green stems. Flowers in umbels. Corona a membranous cup. Follicles smooth.

Species few.

Sarcostemma brevistigma *W. & A.*; *F.B.I.* iv 26, XXVII 1. Stem as thick as an ordinary wooden penholder, with joints 4 to 6 inches apart. Umbels terminal sessile, 1 to 1½ inch diameter. Pedicels ½ inch. Flowers ⅓ inch greenish white. Follicles 4 to 5 by ⅓ inch. Seeds flat ⅙ to ¼ inch. t. **420**.

Nilgiris: at about 5,000 feet and below on rocks. Dolphins Nose near Coonoor, etc. *Fyson* 6408.

Gen. Dist. Deccan and plains in dry places.

TYLOPHORA.

Tylophora mollissima *Wight*; Vol. I p. 282. t. **421**.
Tylophora tenuis *Blume*; Vol. I p. 282. t. **422**.

DREGEA.

Climbing shrubs with opposite cordate acuminate leaves and comparatively large green flowers in axillary umbels. Corona in the form of 5 masses narrowed at their inner ends, broad and rounder at the outer. Polliniums 10 in all, erect. Pods hard thick.

Species few in India, Malaya and tropical Africa.

Dregea volubilis *Benth.*; *F.B.I.* iv 46, XXXIX 1. A tall stout climber on even large trees. Leaves 3 to 6 inches, broadly ovate, cordate acuminate. Peduncles as long. Umbels drooping of numerous green flowers. Petals triangular, ¼ inch long. Pods 3 to 4 inches by 1 to 1½. Smooth and black outside, pale straw-coloured and glossy inside. Seeds ⅛ black, flat. t. **423**.

Nilgiris: Coonoor on Lambs Rk. Rd., Droog, etc. Common. Flowers summer months. *Fyson* 2375, 6298.

HOYA.

Hoya ovalifolia *W. & A.*; Vol. I p. 283. t. **424**.

CEROPEGIA.

See Vol. I p. 284.

Ceropegia elegans *Wall.*; Vol. I p. 285 as **C. sphenantha** *W. & A.* The buds are erect, but the mature flower hangs down and opens sideways. t. **425**.

Fyson 4186.

Ceropegia thwaitesii *Hook.*: *F.B.I.* IV 71, L 20. Very similar in habit to C. elegans *Wall.* Leaves twice to four times as long as broad, acuminate. Flowers like those of C. intermedia but twice as large, 1½ to 2½ in. long, and the coronal processes (5) not dilated upwards. Dome of flower taller than broad. Lobes glabrous. Pods 6 to 8 in. long. t. **426**.

Pulneys; Kodaikānal. *Fyson*, *Bourne* 81, 1134.

Gen. Dist. Ceylon and Tinnevelly hills.

The relative lengths of the cornal lobes and processes vary as also in C. elegans *Wall.* I take this to be Hooker's plant but if it is the figure in Bot. Mag. t. 4758 it is not good.

Ceropegia ciliata *Wt.*; *F.B.I.* iv 72, L 23. A much smaller species than the preceding. Leaves linear-lanceolate to lanceolate, 1½ to 2 inches by ¼ to ½ in., hispidly hairy on both surfaces. Peduncles nearly as long, hispid; as also the ⅓ in. pedicels and calyx. Corolla 1¼ in., slender, pale purple; lobes ⅓ in., forming a narrow dome, glabrous. Coronal lobes hairy, processes longer. t. **427**.

On both plateaus in grass. Nilgiris, Flowers September. *Fyson* 6736.

LOGANIACEÆ.

See Vol. I p. 287. Somewhat resembles APOCYNACEÆ but in having usually stipules, the ovary completely united, the stigma usually bilobed, the fruit a capsule or berry never follicles, and in the absence of a milky juice.

FAGRÆA. F.B.I. 96 IV

Trees or shrubs with opposite leaves, with prominently dilated leaf-bases or stipules. Corolla lobes twisted. Fruit a berry.

Species about 20, from India to Australia.

Fagræa obovata *Wall.*; *F.B.I.* iv 83, IV 5. A low tree or shrub. Leaves 6 by 3 in., obovate. Corolla tube 1½ by ½ in. expanding into a broad 5-lobed limb, 1½ to 2 in. across, creamy white. Berry ½ by 1 in. t. 428.

Nilgiris: Coonoor by the river just above the railway station. On rock at Dolphin's Nose, etc. *Fyson.*

Gen. Dist. Deccan and Ceylon.

GENTIANACEÆ.

See Vol. I p. 288.

EXACUM.

Exacum atropurpureum *Bedd*; Vol. I p. 288. t. 429.
Exacum wightianum *Arn.*; Vol. I p. 289. t. 430.

HALENIA.

Halenia perrottetii *Griseb.*; Vol. I p. 291. t. 431.

BORAGINEÆ.

See Vol. I p. 292.

CONVOLVULACEÆ.

See Vol. I p. 293.

SOLANACEÆ.

See Vol. I p. 295.

Several species of CESTRUM, shrubs with tubular flowers (white or coloured, often inflated and contracted again below the mouth) and small triangular reflexed lobes; BRUNFELSIA shrubs with cream coloured flowers with narrow tube and broad flat lobes; SALPIGLOSSIS and BROWALLIA are cultivated in gardens. Many have very fragrant flowers.

SOLANUM.

See Vol. I p. 295, and add

** No Prickles. Erect Plants.*

Solanum nigrum *L.; F.B.I.* iv 229, 1 1. A small shrub with smooth nearly glabrous branches. Leaves ovate-deltoid, 2 by ¼ inch often slightly lobed at the broadest part. Stem sparingly pubescent. Peduncles outside the leaf-axils, about ½ inch; pedicles ¼ inch. Corolla white. Berry globose ¼ inch, red, black or yellow.

Nilgiris: Ootacamund road-sides, etc. Pulneys: above Pallangi and Vilpatti, etc.

Gen. Dist. India up to 7,000 feet and throughout tropical and temperate countries (England, etc.).

Solanum species X near S. verbascifolium *Linn*; *F.B.I.* iv 230, I 5. A shrub of 10 to 15 feet characteristed by the almost invariable presence in the axils of a pair of ear-shaped small reflexed leaves simulating stipules. All green parts covered with a tomentum of stellate hairs. Leaves, 8 to 14 inches by 3 to 5 inches, ovate, lanceolate, long-acute. Flowers in dense cymose corymbs. Corolla, ⅓ to ½ inch across, lilac or blue, glabrous inside, tomentose outside. Berry ½ inch diameter, pubescent, yellow. t. **432**.

Nilgiris: Coonoor along the stream through Brooklands estate, etc., abundant there.

Obviously an introduction by the way it grows. It differs from S. verbascifolium L., an Indian plant in the tomentose fruits, and the peculiar ear-shaped axillary leaves. It belongs, so I am told, to the *sect* Leptcs-temonum, *sub-sect* Asterotrichotum and § oliganthas.

Solanum læve *Dunal.; F.B.I.* iv 231, I 9. A small shrub with rather thin zig-zag branches. Leaves broadly elliptic, acuminate at both ends, entire glabrous. Flowers fascicled in axillary pedicles, of ½ to 1 inch

white. Sepals 5 linear. Corolla ¼ inch. Berry ⅓ inch red. t. 433.

Nilgiris : in light shade.

Solanum denticulatum *Bl.* var. guakai ; Vol. I p. 296. Calyx teeth 7 or 8.

Solanum macranthum *Dun.* A tree with large lobed leaves, covered with stiff simple hairs on the upper side, and with stellate hairs on the lower ; and bunches of large light and dark blue flowers. Curt. Bot. Mag. t. 4138.

Occurs occasionally in gardens. A native of Brazil.

* * *No Prickles. Climbers.*

Solanum seaforthianum *Dunal.* A climber. Leaves occasionally simple, more often deeply, pinnately-lobed, or compound. Glabrous except for a few hairs, and minute pubescence on the nerves ; terminal lobe largest, ovate or elliptic, acuminate. Flowers in terminal panicles white. *Curt. Bot. Mag.* t. 1982.

Common on trees, in stations of both plateaus

Native of South America and introduced to England by Lord Seaforth in 1804 from the West Indies.

Solanum convolvulus *Sendt.* A climber like the last, but with simple ovate entire leaves, from 1½ to 2 inches by ½ to ¾ inch.

On trees, cultivated. Also Yercaud. Native of South Brazil.

* * * *Prickly shrubs and herbs.*

Solanum wightii *Nees* ; *F.B.I.* iv 234, I 18. A small plant, almost a herb, distinguished at once among our species by the very large flowers. Prickles few and small. All green parts clothed with rather long hairs, and the undersides of the leaves with a very close tomentum as well. Leaves ovate, lobed, 1½ to 3 inches.

Flowers few or solitary, 2 inches across. Lavender-blue. t. 434.

Coonoor: Lamb's Rk. Rd., but not common. Flowers June.

Solanum giganteum *Jacq.*; *F.B.I.* iv 237, I 14. A large shrub, almost a tree, with very white branches and under-surface of the leaves, and armed with a few scattered prickles on the branches. Leaves 6 to 8 inches by 1½ to 3½, elliptic; when young with a few scattered stellate hairs on the upper side, but soon glabrous, densely white tomentose on the lower side. Flowers in terminal or lateral very dense rounded masses; calyx white, corolla lilac, small. Berries ¼ to ⅓ inch, glabrous.

Nilgiris in sholas on the north side of the plateau, Kotagiri, Curzon Tea Estate, etc.

Gen. Dist. South India and Ceylon, 3,000 to 7,000 feet.

Solanum *species Z.* A shrub of 4–6 feet, distinguished among our species of the genus by the margins of the leaves being decurrent as wings 2 to 3 inches down the branches. Densely tomentose all over, especially on the young parts and peduncles with reddish brown branched hairs. Prickles on the stem compressed glossy and curved, like those of a rose, on the leaves narrow and straight. Leaves in general outline ovate, with shallow triangular lobes. Peduncle 1–2 inch, outside the axils. Flowers white, ¾ inch, the coralla divided nearly to the base into narrow ½ inch lobes. Berry 1 inch in diameter, globose-acute, tomentose, green. t. 435.

Nilgiris: Coonoor abundant.

Solanum sisymbrifolium *Lamk.* A low shrub covered rather with glandular hairs and also sharp yellowish prickles. Leaves deeply pinnatifid, covered on both with sides stellate hairs, shorter and closer on the under. Flowers in terminal corymbs white or lilac. Berries

orange-red 1 inch diameter glabrous and glossy, not or hardly overtopped by the calyx lobes. t. **436**. Curtis. Bot. Mag. tt. 2568, 2828.

Nilgiris: Coonoor abundant, Kotagiri, etc. A native of Brazil.

CYPHOMANDRA.

Cyphomandra betacea *Sendt.* Tree Tomato. A shrub or small tree with dark velvetty leaves, smelling strongly of mice. Flowers white. Fruit egg-shaped, smooth. Curt. Bot. Mag. t. 7682.

Nilgiris: Coonoor.

A native of New Grenada, introduced first into England in 1803.

PHYSALIS.

Physalis peruviana, L. Vol. I p. 29, f. 7. t. **437**.

NICANDRA.

Nicandra physaloides, Gaertn. Vol. I p. 298. t. **438**.

DATURA.

See Vol. I p. 298.

a { Large shrub with pendent flowers. vol. 1 p. 298 . . D. suaveolens.
  { Small shrub with erect flowers . . . . *b*.

b { Capsule, opening in 4 valves, flower usually white . . . . D. stramonium.
  { Capsule, irregularly dehiscent; flower purple. D. fastuosa.

Datura stramonium *Linn.*; *F.B.I.* iv 242, VII 1. A small shrub, branching often cymosely, a flower terminating the main stem. Leaves lobed. Flowers erect, usually white. Fruit very spiny, opening in 4 valves. t. **439**.

Native of the Himalayas.

Datura fastuosa *Linn.*; *F.B.I.* iv 242, VII 2. Similar to the last, but flowers larger, usually purple. Calyx up to 3 in. Capsule opening irregularly. Wt. Ic. t. 1396.

Throughout India, a weed of waste places.

SCROPHULARIACEÆ.

See Vol. I p. 299.

VERBASCUM. F.B.I. 103 II

Usually very woolly tall herb. Leaves alternate. Flowers yellow in simple or branched spikes. Corolla flat, upper lobes outside in bud.

Species about 160, in Europe W. & Cent. Asia and N. Africa.

Verbascum thapsus *Linn.*, Great Moth Mullein, *F.B.I.* iv 250, II 1. A stout erect herb 2 to 4 feet high. Leaves oblong narrowed at the base and decurrent as two wings down the stem. Flowers yellow, in dense woolly spikes. Stamens 5, three yellowish woolly with short one-celled anthers two larger, glabrous and with larger anthers Capsule globose. t. **440**.

A weed of waste places and gardens, and also in old clearings. On both plateaus.

Gen. Dist. From Great Britain across Europe and temperate Asia to the Himalaya. Naturalised also in America.

CALCEOLARIA.

Calceolaria mexicana *Benth.*; Vol. I p. 299. t. **441**.

TORENIA. F.B.I. 103 XXIII

Weak glabrous herbs with four-angled stems, opposite leaves and terminal or axillary solitary or umbelled flowers; characterised chiefly by the calyx being winged, and by the upper stamens being very short, the lower

longer and with an appendage on each filament. The four anthers converge in pairs at the back of the corolla. Corolla a wide bell-shape, with four lobes, the upper notched. Capsule linear or oblong, separating septicidally from the seed-bearing axis. Seeds numerous rough.

Species about 30, in the tropics of Asia and Africa.

Torenia asiatica *Linn.*; *F.B.I.* iv 277, XXIII 5. Leaves shortly petioled, ovate, serrate. Pedicels axillary, thicker in fruit. Corolla 1¼ in., blue with dark violet lateral lobes. Filament of the longer (the anterior) stamens with each a projecting tooth. Capsule cylindrical, with very many seeds. t. **442**. Wight Ic. t. 438. t. 862.

Nilgiris: Coonoor in damp shady places on Lambs Rock Road, etc.

Gen. Dist. Mountains of South India, and to Japan. Varieties of this are commonly grown in Madras gardens.

MAZUS.

Small herbs with lower leaves opposite, upper sometimes alternate, and small flowers in terminal racemes. Calyx 5-fid. Corolla tube short, upper lobe erect 2-fid, lower much larger spreading, 3-fid, throat with 2-lobed plate. Stamens 4. Stigma of 2 flat lobes. Capsule small. Seeds numerous.

Mazus rugosus *Lour.*; *F.B.I.* iv 259, XII 1. An annual herb. Radical leaves obovate-spathulate, 1 to 3 in. long, irregularly and coarsely serrate-toothed. Flowering stems numerous, 2 to 10 in. Racemes 1 to 6 in. Corolla ¼ to ½ in. blue. Lady Bourne's Ooty flowers. t. 93.

Nilgiris at Pykara. *Bourne.*

LIMNOPHILA. F.B.I. 103 XVII

Small herbs of marshy places, with aromatic oil in transparent dots. Leaves opposite or whorled, the lower

if in water deeply cut. Calyx of 5 narrow sepals. Corolla tube cylindrical, the upper lobes outside in bud. Stamens 4 all perfect; anther cells separate. Capsule ovoid or oblong. Seeds numerous.

Species about 30, in Africa, Asia and Australia.

Limnophila hypericifolia *Benth.*; *F.B.I.* iv 269, XVII 14. An erect herb with stout unbranched stem of 1 to 2 feet. Leaves half stem-clasping all oblong or ovate, minutely toothed round the obtuse apex. Flowers sessile in the upper axils, ½ to ¾ in., long, erect, tubular, mauve coloured. t. 443.

In marshy places. Nilgiris: at Coonoor, etc.

Limnophila gratioloides *Br.*; *F.B.I.* iv 271, XVII 21. A diffused branched herb, the lower or all leaves usually pinnatifid into narrow toothed segments. Corolla erect ½ to ¾ in., erect pale yellow. Capsule globose. ⅙ in. t. 444.

In shallow water and mud, Nilgiris: Coonoor. *Fyson* 329, 6283.
Pulneys: below Kodaikānal.

Throughout India, in rice fields and swamps and to China, tropical Africa and Australia.

ILYSANTHES.

Ilysanthes hyssopioides *Benth*; Vol. I p. 300. t. 445.

BONNAYA.

Annual glabrous herbs with opposite leaves, characterised by the solitary axillary flowers, which are slightly two lipped, and have lying on the lower lip two yellow staminodes, and by the long narrow capsule. Upper stamens 2, perfect, stigma of 2 lamellæ. Seeds many, rough.

Species few in tropical Asia and Africa.

Bonnaya veronicæfolia *Spreng.*; *F.B.I.* iv 285, XXVI 3. Stem weak often rooting at the lower nodes. Leaves oblanceolate-oblong or elliptic, ¾ to 1 ½ in. by ⅛ to ⅓ in., entire or with distant serrations. Flowers in terminal racemes ½ in., purplish, erect. Pods ½ to ¾ in. by 1 in. t. **446**.

On both plateaus at 6,500 ft.: Kotagiri, Coonoor, Vilpatti and below. *Fyson.* *Bourne* 149. *Sedgwick* 1441.

STRIGA.

Striga lutea *Lour.* Vol. I p. 303. t. **447**.

OROBANCHACEÆ.

Herbs of a brown, purplish, or white colour, never green, parasitic on the roots of other plants. Stem simple, erect, bearing scales instead of leaves, and a terminal spike of flowers each in the axil of a scale. Flowers much as in the SCROPHULARIACEÆ, but the ovary though of two carpels without partition. Seeds numerous.

Twelve genera with about 130 species.

In England species of OROBANCHE Broomrape, and LATHRAEA toothworts occur.

CHRISTISONIA.

Fleshy herbs, as described above. Calyx tubular. Corolla not two lipped, the lobes equal broad and spreading. Anthers cells unequal, one spurred and empty.

Christisonia tubulosa *Benth.*; *F.B.I.* iv 321, II i. Stem tall quite glabrous, 6 to 8 inches. Flowers ½ inch or so apart, racemed, 1 inch long. t. **448**.

Pulneys: Kodaikānal and below.

Gen. Dist. Coorg to Tinnevelly hills.

Christisonia bicolor *Gardn.*; *F.B.I.* iv 322, II 6. Stem hairy short. Flowers 2 to 2½ inches long close together in more or less of a corymb, pale rose or yellow colour. t. 449.

Nilgiris: at 5,500 feet and above. Neduvattam, below Coonoor, etc.

LENTIBULARIACEÆ.

See Vol. I p. 306.

GESNERACEÆ.

See Vol. I p. 309 and add:

DIDYMOCARPUS. F.B.I. 106 IV

Herbs with no leafy stem above ground, all the leaves radical. Flowers on a branched leafless stem. Corolla tube cylindrical, not 2-lipped. Stamens 2 perfect, 2 or 3 imperfect. Capsule linear. Seeds ellipsoid smooth.

Species 80 from India through Malaya to China and Australia.

Didymocarpus rottleriana *Wall.*; *F.B.I.* iv 353, IV 32. Leaves much wrinkled, upper surface covered with short hairs, lower tomentose on the fine reticulations. Upper part of flowering stem glandular-pubescent. Flowers mauve-pink. Capsule 1 inch very slender.

Nilgiris and Pulneys at 5,000 feet and above. Common on the Kodaikānal ghat path at Shembaganur.

The leaves are very like those of the English Primrose but hairy.

KLUGIA.

Klugia notoniana *DC.*; Vol. I p. 309. t. 450.

ACANTHACEÆ.

See Vol. I p. 310 and add:

THUNBERGIA.

Climbing plants with opposite leaves, and flowers pedicelled in the leaf-axils; distinguished from all other by the two large sepal like bracteoles, the calyx reduced to a mere ring or a circle of small teeth, and the fruit depressed globose with stout beak (sterile part) above.

Species about 70 in the tropics of the old world.

T. grandiflora *Roxb.* with large blue-flowers is common in Madras Gardens. T. mysorensis has a yellow flower with brown centre.

Thunbergia tomentosa *Wall.*; *F.B.I.* iv 391, I 2. Leaves ovate, lobed or not at the base. Bracts 1 inch. Calyx teeth very slender, up to ¼ inch long. Corolla pure white, tube 1½ inch narrow, limb 2 inches across flat. Capsule with beak 1 to 1½ inch hairy.

On the Ghats, up to 6,500 feet.

STROBILANTHES.

Strobilanthes foliosus *T. Anders.*; Vol. I p. 311, var **capitatus.** Old stems very thickly covered with glandular hairs which emit a strong scent similar to that of sandal-wood oil. t. **451.**

Flowered in profusion in sholas at Shembaganur, in 1918 and on Lamb's Rock Road, Coonoor, etc., about the same time. *Fyson* 6281.

Strobilanthes gossypinus *T. Anders.*; *F.B.I.* iv 434, XVIII 14. A beautiful plant with all green parts covered with yellowish wool, and dull gold woolly spikes, as also the corolla.

Flowered near Ootacamund, October 1917.

Strobilanthes consanguineus *Clarke*; *F.B.I.* iv 435, XVIII 17. "Similar to S. cuspidatus, Vol. I p. 312, 11.

t. 207, but leaves more distinctly toothed and flowers smaller."

Pulneys on the downs. *E. T. Bourne.*

Strobilanthes wightianus *Nees*; *F.B.I.* iv 438, XVIII 24. Hairy on all green parts. Leaves about 1 by ¾ ovate finely serrate. Heads of flowers ovoid, the bracts longer than the calyx, ovary glabrous at the tip. Flowers pale blue with darker lines. Wight Ic. t. 1514.

Nilgiris: at 7,000 feet, etc., Krurmund, flowered in September 1908. *Bourne* 5220.

Strobilanthes pulneyensis *Clarke*; *F.B.I.* iv 438, XVIII 25. Hairy on all green parts. Leaves ovate, acuminate, serrate, about 3 by 2 inches. Flowers in very flat heads, the bracts forming rosettes. Corolla bluish; ovary hairy at tip. t. 452.

Pulneys: Kodaikānal and below. Feb. 1918.

Strobilanthes perrottetianus *Nees.*; *F.B.I.* iv 439, XVIII 27. Leaves ovate, acute or shortly acuminate, covered as all green parts very regularly with rather broad reddish hairs, and also when dry lineolate by the minute linear crystals below the surface. Corolla 1 inch pale lilac, the narrow lower part entirely enclosed in the bracts. Filaments hairy, ovary glabrous.

Nilgiris: at Pykara, Flr. Sep. 1908. *Bourne* 5244. Pulneys on the upper downs, Marian shola, Flr. June 1918. *Fyson* 4800.

Strobilanthes zenkerianus *T. Anders.*; *F.B.I.* iv 439, XVIII 28. Very similar to S. foliosus but the spikes lengthen and become cylindrical. Quite glabrous. Leaves often in threes. Bracts green with purple patch at the base. Corolla tube ⅜ to ¾ inch distinctly exserted beyond the sepals; which are longer than the bracteoles but shorter than the bract; broader part of

corolla as long or longer, by ½ inch wide, pale purplish blue at tips of lobes.

On both plateaus Nilgiris, Ootacamund, Flr. 1 October 1915; Pulneys, Shembaganur, July 1910. *Fyson* 3904, 1184.

Strobilanthes luridus *Wight.*; *F.B.I.* iv 450, XVIII 64. A stout straggling shrub remarkable for the flowers being in erect spikes on the old wood, and having very broad bracts. Leaves 6 by 3 ½ inches, ovate acute, softly hairy on both sides, finely crenulate. Spike 6 to 10 inches. Bracts 1¼ by ¾ inches broadly obovate, very glandular, sticky. Bracteoles and sepals nearly as long, narrow. Corolla 1 to 1¼ inches. Glabrous outside slightly 2-lipped, lurid purple. Capsule ¾ inch. Seeds ⅙ inch across, obovate or nearly circular, very thin. t. 453.

Nilgiris: Coonoor on Lambs Rock Road at 6,000 feet; flowered 1918.
Pulneys: Neutral Saddle shola at 5,500 feet; Flr. 1904. *Fyson* 6510. *Bourne* 5251.

Strobilanthes asper *Wight.*; *F.B.I.* iv 452, XVIII 68. Characterised by the spikes of flowers being fascicled at the ends of slender axillary peduncles. Leaves ovate or elliptic, acuminate, coarsely serrate, scabrid on both sides, and very much lineolate on the upper, by the sub-epidermal linear crystals. Peduncles 1 to 3 inches. Spikes ½ to ¾ inch shortly stalked, fascicled or in a short raceme. Bracts ⅓ inch ovate acuminate; bracteoles and sepals about as long narrower. Narrow (lower) part of corolla not exserted beyond the sepals.

Nilgiris: Neduvattam, Flr. September 1908. *Bourne* 5250.

Strobilanthes sessilis *Nees.*; *F.B.I.* iv 452, XVIII 69. A small shrub, distinguished from all our species by its stalkless leaves. Stem 12 to 18 inches hairy on all green parts. Leaves sessile ovate acute, 1 by ¾ inch hairy on both surfaces, lineolate also on the upper. Spikes

cylindrical, in the upper axils or in dense racemes, bracts ½ inch ovate acuminate, closely imbricate in furrows. Corolla blue, 1 inch or more, pubescent outside and in lower part enclosed in the bracts.

Nilgiris: on the downs, Flr. July 1904. *Bourne* 4603.

BARLERIA.

Shrubs with opposite leaves and showy flowers. Sepals four, two outer larger than the two inner. Corolla lobes imbricate in bud. Stamens two perfect, two small and rudimentary, sometimes a fifth (also rudimentary) present. Ovary with two ovules in each cell only.

Species 100, mostly in the warm parts of the Old World.

Some of the species flower only when several years old and then die, so flower profusely at long intervals, as with STROBILANTHES.

Barleria involucrata *Nees.*; *F.B.I.* iv 483, XXII 10. A small shrub or herb. Leaves elliptic, narrowed to the base, with scattered hairs and raphids on the upper surface, and hairy on the nerves of the lower. No bracts; bracteoles 2, lanceolate acute, much shorter than the two large lanceolate acute sepals which are an inch or more long and densely covered with yellow hairs. Corolla blue, tube 1¼ inch, lobes as long. t. 454.

Pulneys: Tiger shola 5,500 feet. *Fyson* 4750. Nilgiris height.

ASYSTASIA.

Weak stemmed shurbs with opposite leaves, and terminal one-sided racemes of flowers. Corolla lobes imbricate in bud. Stamens four. Capsule with four seeds only.

Species about 20, in the tropics of the Old World.

Asystasia crispata *Benth.*; *F.B.I.* iv 494, XXV 5. Leaves elliptic, ovate or oblong, acute. Corolla ½ inch white with pink or purple marks on the palate. t. 455.

Nilgiris: Coonoor and below. *Fyson* 6275. Pulneys: on the ghat path. Fyson 4798. (Figured.) Except in colour very similar to the light yellow A. coromandeliana of Madras hedges.

ANDROGRAPHIS.

See Vol. I p. 314.

Andrographis lineata *Nees.*; Vol. I p. 315. t. **456.**

RUNGIA.

Rungia læta *Clarke.*; Vol. I p. 318. t. **457.**

VERBENACEÆ.

VERBENA.

Verbena bonariensis *Linn.*; Vol. I p. 320, *not* t. **214.** which is V. venosa.

CLERODENDRON.

Clerodendron serratum *Spreng.*; Vol. I p. 320. t. **458.**

LABIATÆ.

See Vol. I p. 430.

PLECTRANTHUS.

See Vol. I p. 321.

Plectranthus wightii *Benth.*; Vol. I p. 322. Flowers white with pink spots. t. **459.**

Plectranthus nilghiricus *Benth.*; Vol. I p. 322. Flowers blue. Panicle quite different from the preceding. t. **460.**

Plectranthus macræi *Benth.*; Vol. I p. 323. Flowers mauve, small. t. **461.** *Fyson* 4388, figured.

Plectranthus urticifolius *Hook. f.*; Vol. I p. 324. Flowers compressed, violet. t. **462.**

POGOSTEMON. F.B.I. 112 XII.

Pogostemon wightii *Benth.*; *F.B.I.* IV 635, XII 16. Leaves and spikes and all parts broader and less hairy than in P. mollis, the calyx especially much less hairy and larger.

In damp places. Nilgiris: Lamb's Rk. Rd., Coonoor. Pulneys: Kodaikanal, etc. *Fyson* 1385, 4339 (figured). *Bourne* 2101. Probably only a shade or damp ground form of the next.

Pogostemon mollis *Benth.*; Vol. I p. 326. t. 463.

DYSOPHYLLA.

Flowers small in long very dense spikes. Corolla minute, not two-lipped. Stamens exserted, the filament very long and bearded.

Species about 15, in tropical Asia and Australia.

Dysophylla auricularia *Bl.* *F.B.I.* IV 628, XIII 4. Stem and all green parts villous with long hairs. Leaves sessile, 2 by 1 in., ovate-elliptic, serrate. Spikes terminal, hairy, whorls confluent. t. 464.

Nilgiris: on rocky hills, above Coonoor. *Fyson* 5739. Pulneys: Machur. *Bourne* 633.

CALAMINTHA.

Calamintha umbrosa *Benth.*; Vol. I p. 328. t. 465.

For **SCUTELLARIA** and **BRUNELLA** see Vol. I p. 329.

LEUCAS.

See Vol. I p. 331.

Leucas marrubioides *Desf.*; Vol. I p. 331, t. 466.

Leucas rosmarinifolia *Benth.*; Vol. I p. 332, t. 221 not figured, i.e. (which is of an unusual piece).

Leucas helianthemifolia *Desf.*; Vol. I p. 333, t. 467.

Leucas lamiifolia *Desf.*; *F.B.I.* iv 686, XVV 24. A very stout herb woody below. All green parts covered thickly with brown hairs. Masses of flowers mostly terminal, 1¼ across. Calyx teeth hairy, longer than the hairs of the mouth. t. **468.**

Nilgiris: Coonoor, abundant on hills above.

Leucas vestita *Benth.*; Vol. I p. 334. t. **469.**

Leucas hirta *Spreng.*; var. *prostrata*; *F.B.I.* iv 687, XLV 26. A low weak stemmed plant. Corolla entirely white. t. **470.**

Nilgiris: Coonoor on road sides and dry places. *Fyson* 3372. Kotagiri in Eucalyptus coppices. *Sedgwick* 1625.

F.B.I. suggests that this is a dry form of L. vestita, but the latter has the upper lip of the corolla brown.

Leucas linifolia *Spreng.*; *F.B.I.* iv 690, XLV 38. Stem 1 to 2 feet. Leaves linear 1½ to 2 inches by ⅛ to ⅙ inch entire or serrate. Whorls at the ends of the branches. Calyx with very oblique mouth, the upper side longer and acute. t. **471.**

AMARANTACEÆ.

Herbs with alternate or opposite leaves and terminal or axillary spikes of flowers, with one whorl only of perianth (the sepals) and three scarious bracts and bracteoles; as many stamens opposite the sepals, sometimes united by a membranous cup at the base, or with intervening staminodes; and a dry papery fruit with usually one erect black shining seed inside which the embryo lies curled round the endosperm.

Genera about 50, species 500 in the tropical and subtropical countries.

ACHYRANTHES. F.B.I. 116 XV.

Characters as above. Leaves opposite: Spikes very slender. Flowers reflexed, with bract and bracteoles. Sepals spiny. Stamens connate at the base with many

staminodes each of which has a toothed scale at the back. t. 464.

Species about 15.

Achyranthes aspera *Linn.* var. **rubro-fusca**; *F.B.I.* iv 730, XV 2. Stem 1 to 3 feet simple. Leaves orbicular or elliptic, variable, usually thick and tomentose or velvetty. Spikes rigid lengthening as flowers open. Flowers ⅙ inch hardening as the seeds set. Bracteoles ovate half as long as their spine. Stamens 5, staminodes fimbriate.

Nilgiris: at Coonoor. *Fyson* 3081.

Achyranthes bidentata *Bl.*; *F.B.I.* IV 730, XV 2. Very similar to the preceding but the two bracteoles of each flower reduced to small spines without any blade, and staminodes not fimbriate. Flowers ¼ inch. Leaves acuminate. t. 472.

Nilgiris: Ootacamund, Kotagiri. Pulneys: Kodaikanal. *Fyson* 4327. *Sedgwick* 1630.

CHENOPODIACEÆ.

Herbs with simple alternate leaves, usually covered as also the flowers with a white mealy powder. Flowers with small sepals, no petals. Stamens 5, no staminodes. Ovary with 1 ovule, in fruit usually enclosed in the fleshy calyx. Embryo simply or spirally curled round the endosperm.

Genera 75, species 500, most of them in salty places, sea marshes, etc.

Well known plants are Beta, cultivated as a vegetable and the source of Beet-sugar; Spinacia, spinach; Salicornia Glass wort.

CHENOPODIUM. F.B.I. 1172.

Erect or prostrate herb, stem angled. Flowers minute. Embryo curled round the endosperm.

Species 60, in temperate climates.

Chenopodium ambrosioides *Linn.* ; *F.B.I.* v 4 117. A tall well branched herb, leaves lanceolate but much cut or coarsely toothed, scented by oil glands. Flowers in small clusters on the short branches of slender axillary panicles 6 inches long, with small leaves.

Nilgiris: Ootacamund, Kotagiri, Coonoor, etc. A weed of cultivation. *Fyson* 6409.

PHYTOLACCAEÆ.

Phytolaca dioica *L.* ; Vol. I p. 337. t. 581.

POLYGONACEÆ.

POLYGONUM.

See Vol. I, p. 339.

Polygonum alatum *Hamilton* ; Vol. I p. 339, t. 473.

Polygonum chinense *Linn.* ; Vol. I p. 339. Expansions at the base of the leaves sometimes absent. t. 474.

Polygonum strigosum *Br.* ; Vol. I p. 340, t. 475.

Polygonum rude *Meissn.* ; *F.B.I.* v 49, III 58. A shrub with zig-zag branches covered all over with closely depressed hairs, stipule papery, covering the bud, but usually splitting to the base, not leaving a tube round the branch. Leaves 4 to 6 by ½ to 2 inches, lanceolate or elliptic acute, entire, with very regular pinnate venation, hairy on both sides, almost silvery on the under surface. Flowers ⅛ inch in large branched panicles, the branches of which have curly hair. Stamens 8. Nut ⅛ inch 3 angled.

Nilgiris: Ootacamund in gardens. *Fyson* 2972 a native of the Khasia mountains.

FAGOPYRUM.

See Vol. I p. 340.

RUMEX.

See Vol. I p. 341.

PIPERACEÆ.

See Vol. I p. 342, and add under:

PEPEROMIA. VOL. I P. 345.

Peperomia thomsoni *Hook. f.*; *F.B.I.* v 97, III 4. Stem stout naked in lower part. Leaves alternate, elliptic-ovate sub-acute five nerved. Flower spikes slender as long as the leaves, longer in fruit, up to 3 inches erect.

Pulneys, Glen Falls, Kodaikanal, 7,000 feet. *Fyson* 4801.

Gen. Dist. Deccan to Ceylon.

LAURINEÆ.

See Vol. I p. 346.

CINNAMOMUM.

Cinnamomum wightii *Meissn.*; Vol. I p. 347. t. 476.

LITSÆA.

Litsæa wightiana *Wall.*; Vol. I p. 349. t. 477.

Litsæa ligustrina *Nees.*; *F.B.I.* v 158, XII 7. A small tree, glabrous or pubescent. Leaves 3 to 4 inches elliptic with very fine reticulations between the pinnate nerves. Umbels axillary or lateral on peduncles of ½ to ¾ inch. Bract glabrous or pubescent, filament hairy. t. 478 Wight Ic. t. 1835.

On both plateaus—Nilgiris: Coonoor. Pulneys: Kodaikanal 7,500 feet, and below to Neutral saddle 5,500 feet. *Fyson* 4328, 6511. *Bourne* 2381. Flr. summer months.

Gen. Dist. On ghats from Nilgiris southwards.

NEOLITSÆA.

Neolitsæa zeylanica *Merril*; Vol. I p. 350. t. 479.

MACHILUS. F.B.I. 128 VIII.

Evergreen trees with alternate feather-veined leaves and bisexual flowers in axillary panicles. Perianth segments six. Three whorls of stamens perfect, 9 in all, outer and next whorl without glands and anthers opening inwards; third whorl with a pair of glands each and anthers opening outwards; staminodes (of fourth whorl) cordate. Perianth segments in fruit deflexed (difference from next genus).

Species about 15.

Machilus macrantha *Nees.*; *F.B.I.* v 140, XIII 13. A large tree, branches brown when dry. Leaves 3 to 9 by 1½ to 2 to 3½ inches oblong rounded or elliptic, acute at both ends; long-petioled. Panicles grouped in a sub-terminal corymb, anthers pubescent. Pedicels ⅓ inch. Flower ¼ inch. Fruit black ½ to ¾ inch diam. Wight Ic. t. 1,824.

Nilgiris on the Ghats below Coonoor. *Fyson* 6400.

PHOEBE.

Evergreen shrubs and trees with alternate penni-nerved leaves, and flowers in open panicles. Stamens as in the last genus. Perianth segments in fruit erect.

Phoebe paniculata *Nees.*; *F.B.I.* v 142, IX 5. A tree. Young shoots covered with rusty tomentum, leaves elliptic or obovate, acute at both ends, rusty tomentose underneath. Panicles axillary, long peduncled. Pedicels ¼ to ⅓ inch. Flowers $^1/_5$ inch.

Species about 30, in India and Malaya.

Pulneys: Shembaganur, *Fyson* 2571. Flr. May.

Gen. Dist. Central Himalayas and the Nilgiris.

THYMELEACEÆ.

LASIOSIPHON.

Lasiosiphon eriocephalus *Decaisne*; Vol. I p. 351. t. 480.

LORANTHACEÆ.

See Vol. I p. 352.

LORANTHUS.

See Vol. I p. 353 and add:

Loranthus intermedius *Wight*; *F.B.I.* v 205, I 5. Habit very much that of L. obtusatus, q. v., but leaves opposite and alternate, and flowers stout.

Nilgiris: Coonoor.

Loranthus obtusatus *Wall.*; Vol. I p. 353. Petals 4 not 5. t. 481.

Loranthus tomentosus *Heyne.*; *F.B.I.* v 221, I 27. Leaves alternate obtuse with lower side rusty tomentose as also on all green parts. Flowers in axillary sessile short stalked fascicles densely villous. Bracts scale like, no bracteoles. Corolla tube curved, not inflated, split to the middle. Filaments short anthers oblong. t. 482.

Nilgiris: Coonoor.

Loranthus bracteatus *Heyne.*; *F.B.I.* v 213, I 28. Similar to the preceding, but the green parts with grey not rusty tomentum, and bract longer than the calyx, even, ½ inch. Corolla tube inflated in middle. Wt. Ic. t. 378.

Nilgiris.

Loranthus recurvus *Wall.*; *F.B.I.* v 213, I 30. Young parts with grey or buff pubescence. Leaves all alternate, obovate cuneate drying dark green, glabrous above, buff coloured below, three-nerved at the base. Flowers in numerous axillary tomentose fascicles. Corolla inflated curved. t. 483. Wt. Ic. t. 305.

Loranthus longiflorus *Desr.*; *F.B.I.* v 215, I 35. Leaves sessile or peotioled, cordate to ovate or linear, glabrous. Flowers 1½ inch in short crowded more or less horizontal erect racemes. Bract scale like; bracteoles absent. Calyx very slightly lobed. Corolla slender slightly inflated above the middle then suddenly

contracted below the greenish ⅓ inch lobes. Anthers ⅙ inch erect.

Coonoor: near the Club. *Fyson* 6512.

Loranthus memecylifolius *W & A.*; Vol. I p. 355. A plant which appears to be this species at Coonoor, has flowers pale orange yellow at base and tip, green in the middle. t. 484.

Flr. end of April. *Fyson* 6230, 6287, 6318.

Loranthus capitellatus *W. & A.*; *F.B.I.* v 221, I 55. Very similar to L. loniceroides. Leaves all opposite, oblong ovate. Flowers in shortly stalked axillary fascicles. Two bracteoles as well as a bract clasping the base of the calyx. Corolla ½ to ¾ inch inflated upwards. Fruit globose; surmounted by the calyx. t. 485.

VISCUM.

See Vol. I p. 223 but for

Viscum japonicum *Thun.* read **Korthalsella japonica,** Van Tieg. t. 486.

Viscum orbiculatum *Wt.*; *F.B.I.* v 224, II 5. Branches green grooved, often bifurcating. Leaves all opposite, broadly elliptic or rounded, entire, 3 or 5 nerved at the base. Flowers in sessile axillary clusters of 3 to 5. Fruit oblong rounded at both ends. t. 487. Wight. Ic. t. 1,016.

Nilgiris: at Coonoor.

Habit very much that of the English Mistletoe but leaves much broader.

SANTALACEÆ.

See Vol. I p. 357.

THESIUM.

Thesium wightianum *Wall.*; Vol. I p. 357. t. 488.

OSYRIS.

Osyris arborea *Wall.*; Vol. I p. 357. t. 489.

BALANOPHORACEÆ.

See Vol. I p. 358.

EUPHORBIACEÆ.

See Vol. I p. 361 and add :

EUPHORBIA.

Euphorbia helioscopia *Linn.*; Vol. I p. 360. t.

Euphorbia oreophila *Miq.*; Vol. I p. 360 as E. Rothiana Spreng., t. 490. See Sedgwick *Jour. Bom. Nat. Hist. Soc. XXXVI, p.* 599.

BRIDELIA. F.B.I. 135 IV.

Shrubs or trees. Leaves alternate entire with strong straight venation. Flowers small in simple or spicate clusters, monoecious. Sepals 5. Petals as many smaller. Stamens 5, their filments united below into a column which bears a pistillode. Ovary 2-celled. Drupe small with 1 or 2 stones.

Species about 30 in tropical Africa, Asia and Australia.

Bridelia retusa *Spreng.*; *F.B.I.*, 268, IV 1. A tree or large shrub, with elliptic and oblong or ovate leaves, 3 to 5 inches long, easily recognized by 15 to 20 pairs of strong straight veins pinnately arranged along the midrib. Flowers 1/6 inch in diameter, 1/4 inch, clusters axillary or in spikes, pubescent or glabrous. Fruit 1/4 inch, purple black. t. 491. Bedd Fl. Syl. 6 CCLX.

Nilgiris and Pulneys, at about 5,000 feet and below.

Gen. Dist. Throughout hotter parts of the Old World.

PHYLLANTHUS.

See Vol. I p. 362.

Phyllanthus rheedii *Wight*; Vol. I p. 363. A well-branched under-shrub. Leaves thin, or flaccid. t. 492.

Nilgiris : Coonoor. Flowers, September.

Phyllanthus simplex *Retz.*; Vol. I p. 363. After the first rains in April or May straight simple stems shoot up and bear the leaves very regularly disposed; later it becomes a branched undershrub. The leaves show very marked sleep movements. Petals as long as the sepals broadly triangular. t. 493.

Nilgiris: Coonoor.

GLOCHIDION.

See Vol. I p. 363.

Glochidion neilgherrense *Wt.*; Vol. I p. 364. An abnormal probably diseased form of male flower is very common, the pedicels being thicker, erect and the whole flower larger, with the anther incumbent on a central conical or dome-shaped mass. t. 494, 495.

Nilgiris.

Glochidion velutinum *Wight*; Vol. I p. 364. t. 496.

BREYNIA. F.B.I. 135 XXIII.

Shrubs and trees. No petals. Stamens 3, filaments united. Fruit fleshy.

Species about 12 in tropical Asia, Africa and the Pacific Islands.

Breynia patens *Benth.*; *F.B.I.* V 329, XIII 1. A small shrub with spreading branches, and leaves usually all facing upwards. Flowers at first drooping, in fruit erect. t. 497.

Nilgiris. In light shade or by the road side 5,500 feet and below.

Gen. Dist. Tropical Himalayas to Deccan.

DAPHNIPHYLLUM.

Daphniphyllum glaucescens *Blume*; Vol. I p. 365. t. 498.

ANTIDESMA. F.B.I. 135 XXIII.

Trees and shrubs with entire leaves and unisexual flowers in slender simple or panicled spikes. No petals. Stamens 2 to 5, inflexed in bud. Fruit small.

Species about 70 in tropical Asia, Africa, Australia and Pacific Islands.

Antidesma menasu *Miq.*; *F.B.I.* v 364, XXIII 25. A small tree. Leaves elliptic oblong, glabrous, 5 to 8 inches by 1½ to 2¼ inches. Spikes 4 to 6 inches. Male flower 1/12 inch in diameter, pedicels 1/16 inch. Female flowers sessile. t. 499.

Nilgiris and Pulneys ; 6,000 feet and below Coonoor, Shembaganur, etc.

CROTON.

Tree or shrubs. Leaves alternate with 2 glands at the base. Flowers solitary or clustered in a terminal raceme with small bracts, monoecious. Male flowers with petals, female without. Stamens numerous free, the anther inflexed in bud. Fruit a capsule.

Species many in all hot countries. The common garden crotons belong really to a slight different genus CODIÆUM.

Croton aromaticus *L.*; *F.B.I.* v 388, XXXIV. An aromatic shrub. Leaves 2 to 4 in. by 1 to 3 in. scabrid on the upper side, pubescent on the lower. Ovary hispid with stellate hairs. Capsule obscurely lobed. t. 500. Wight Ic. t. 1915.

Nilgiris : Kotagiri, etc.

MALLOTUS. F.B.I. 135 LIII.

Trees and shrubs with opposite or alternate leaves. Flowers small without petals, in terminal panicles or spikes. Stamens in the male 20 to 30, filaments free, anthers globose. Ovary in the female flower, of 2 to 4 cells, each with 1 ovule. Fruit a capsule.

Species about 80, in the tropics of the Old World.

Mallotus albus *Muell.*; *F.B.I.* v 429. LIII 5. An evergreen tree with young parts densely covered with a rusty or white tomentum. Leaves ovate, acute, very obtuse almost horizontal at the base, with stalk inserted ⅛ in. inside the margin, and basal nerves 5. Panicles terminal. Female flowers ¼ in. covered with short soft spines which are thickly clothed in dense, white tomentum.

Pulneys at 6,500 feet just below Kodaikanal. *Fyson* 443.

Gen. Dist. Himalayas to Ceylon and Burma.

Mallotus philippinensis *Muell.*; *F.B.I.* v 442, LIII 42. Leaves 3 nerved at base, ovate acute. All young parts covered with reddish hairs, ovary covered with crimson glands, but not with spines. t. 501.

Nilgiris: below Coonoor on the Ghat road at 5,000 feet.
Gen. Dist. From Kashmir to Singapore, Ceylon, China and Australia.

MACARANGA. F.B.I. 135 LVI.

Trees and shrubs. Leaves large with stalk inserted inside the margin, and glands on the underside. Flowers without petals, in axillary racemes. Stamens in male one or two only. Capsule small, seeds globose.

Species about 80, in the Old World tropics.

Macaranga indica *Wt.*; *F.B.I.* v 446, LVI 15. A large tree. Male flowers in the axils of short branches (of the panicle) which end each in a large (⅙ in.) flat open gland. t. 502. Wight Ic. 1883.

Nilgiris: in sholas at 6,000 feet. Lamb's Rk. Rd., Coonoor, etc.

Gen. Dist. From Sikkim southwards.

URTICACEÆ.

See Vol. I p. 367.

CELTIS.

See Vol. I p. 367 and add:

Celtis wightii *Planch.*; *F.B.I.* V 483, IV 4. This is, I believe, the species of the plant described in Vol. I p. 368 under the name C. cinnamomea *Lindl.* and now shown in t. **503**.

TREMA.

Trema orientalis *Bl.*; Vol. I p. 369. t. **504**.

PHYLLOCHLAMYS.

This genus does not occur here, the plants named in Vol. I pp. 369–70 being probably spiny branches of Sideroxylon tomentosum *Roxb.* (p. 67).

DORSTENIA.

Small herbs with minute flowers imbedded in a flat angular receptacle.

Dorstenia india *Wall.*; *F.B.I.* V 494. Leaves ovate, entire, receptacle, ½ inch diameter with 4 or 5 projecting arms. t. **505**.

PILEA.

See Vol. I p. 371.

Pilea trinervia *Wt.*; Vol. I p. 372. t. **506**.

ELATOSTEMA.

See Vol. I p. 372.

Elatostema lineolatum *Wight.*; Vol. I p. 373. t. **507**.

Elatostema surculosum *Wight.*; Vol. I p. 373. t. **508**.

POUZOLZIA.

See Vol. I p. 374.

Pouzolzia wightii *Benn.*; Vol. I p. 375. t. **509**.

CUPULIFERÆ.

See Vol. I p. 377.

BURMANNIACEÆ.

See Vol. I p. 379.

ORCHIDACEÆ.

See Vol. I p. 379.

MICROSTYLIS.

See Vol. I p. 385.

Microstylis rheedii *Wt.* ; Vol. I p. 384. t. **510.**

ERIA.

See Vol. I p. 386.

Eria braccata *Lindl.* ; Vol. I p. 386. Lady Bourne has pointed out to me that the illustration, t. **242**, is not true to the plant. The leaves are nearly twice the normal length. The flower is shown hanging upside down, as it sometimes does; but more often it faces upwards.

COELOGYNE.

See Vol. I p. 388.

Coelogyne mossiæ *Rolfe.* ; Vol. I p. 391, ii, t. 247.

This is the common large plantation orchid of the hill sides and rocks of Kodaikanal. I am informed by Sir David Prain, C.M.G., Director of Kew Gardens, that they have at Kew only one sheet of C. glandulosa *Lindl.*, which appears therefore not to be the Kodaikanal plant.

CALANTHE.

Calanthe veratrifolia *Br.* ; Vol. I p. 391. t. **511.**

ARUNDINA. F.B.I. 148 XXXIX.

Ground orchids with grass-like leaves and large red flowers, very much like that of COELOGYNE, but without any projecting foot at the base of the column, and with 8 polliniums. No spur.

Species few in India, Malaya and China.

Arundina bambusifolia *Lindl.; F.B.I.* V 857, XXXVIII I. Stem nearly ½ inch thick, 1½ feet high, unbranched. Leaves 6 to 10 inches by ½ to ¾ inch sheathing at the base. Raceme 6 inches, terminal, flowers 1 or 2 only, 2 inches across, crimson. t. **512**. Wight Ic. t. 166.

Pulneys: at foot of Perumal 5,300 feet. *Fyson* 4354. *Bourne* 1544.

EULOPHIA.

See Vol. I p. 392.

Sepals five-nerved; lateral lobes of lip, acute crenate, larger than the middle lobe which has three ridges down the centre. t. **513** ... ... E. pratensis.

Sepals nine-nerved; lateral lobes of lips very small mid-lobe larger, rounded with 5 to 9 ridges down the centre. t. **514** ... ... E. nuda.

AERIDES.

See Vol. I p. 394.

SACCOLABIUM.

Saccolabium filiforme Vol. I p. 396. The figure, t. **250**, is printed upside down, and reproduced again, correctly, as t. **515**.

CLEISOSTOMA.

Tree orchids with creeping stem, and small flowers in lateral racemes. Spur short not septate, and its mouth almost closed with a callus or lamella.

Species about 20.

Cleisostoma tenerum *Hook. f.; F.B.I.* vi 73, LXVI 7. Stem ⅙ inch thick. Leaves sessile 2 by ¾ inch, oblong notched, flowers brownish, with darker lines. t. **516**. Wight Ic. t. 1683.

Pulneys: near Kodaikanal in the Pambar ravine. *Fyson* 4260, and at Tigershola 5,000 feet. *Bourne* 1842, 2947, Nilgiris.

SPIRANTHES.

See Vol. I p. 397.

CHEIROSTYLIS.

Cheirostylis flabellata *Wt.;* Vol. I p. 398. Stem 3 to 6 inches. Flowers white. t. **517**.

HABENARIA.

Habenaria travancorica *Hook. f.;* Vol. I p. 400. Flowers white. t. **518**.

Habenaria rariflora *A. Rich;* Vol. I p. 400. t. **519**.

In thin soil. Flowers white.

Habenaria susannae *Br.; F.B.I.* vi 137, CVI 15. A robust plant of 2 to 4 feet. Leaves ovate-oblong 2 to 6 inches long, clasping the stem at the base and erect. Flowers few large. Side lobes of lip over 1 inch divided deeply into narrow segments. Spur 5 to 6 inches. t. **520**. Wight Ic. t. 920.

Pulneys, 4,000 to 5,000 feet.

Gen. Dist. Western Ghats 4,000 feet. Tropical Himalayas to Travancore, Malaya Islands and China.

Habenaria crinifera *Lindl.; F.B.I.* vi 1 and 2, CVI 31. Similar to H. longicalcarata (Vol. II t. 254), but several flowers in a short raceme. Side lobes of lip cuneate cordate. Wight Ic. t. 926.

Pulneys: reported on the downs.

Habenaria longicornu *Lindl.; F.B.I.* vi 139, CVI 24. Stem ½ to 1½ feet. Leaves mostly from near the base, narrow, 6 by ½ inch. Flowers many in an oblong head. Bracts narrow acuminate, 1 inch. Ovary a little longer. Spur 2 inches. Sepals ovate, ⅓ by ¼ inch. Petals much smaller. Lip three partite; middle lobe ¼ by ¾

inch, side lobes ½ inch acute straight on inside, with side margin finely toothed. t. **521.**

Pulneys : in grass.

Gen. Dist. Nilgiri, Pulney and Travancore Mountains. Flr. Ooty., Sep.

Habenaria elliptica *Wt.;* Vol. I p. 402. Flowers white with scent of Lily-of-the-valley. t. **522.**

Habenaria heyneana *Lindl.;* Vol. I p. 148. t. **523.**

Habenaria aristata *Hook. f.; F.B.I.* vi 158, CVI 82. A slender plant. Leaves 3 or 4; clustered about a third above the ground, elliptic, acute at both ends, nine-nerved. Stem nearly bare for the next third, spike slender. Bracts ¼ inch, shorter than the ovary. Sepals and petals ⅙ inch. Lip three partite, the side lobes filiform ¾ inch, divergent, middle lobe ⅛ inch. t. **524.**

Pulneys : in light shade near Kodaikānal. *Fyson* 4446.

Habenaria perrottetiana *A. Rich.; F.B.I.* vi 164, CVI 103. Remarkable for its yellow flowers and the very broad sepals and longitudinally folded lip. Stem stout 1 to 2 feet. Leaves 2 to 3 inches long, passing upwards into the bracts. Sepals ¾ by ⅓ inch, obtuse, concave. Petals erect, narrow; lip triplicate in bud. t. **525.**

Pulneys : on the downs in grass. *Fyson* 4452.

SATYRIUM.

Satyrium nepalense *Don*; Vol. I p. 406. t. **526.**

DISPERIS.

See Vol. I p. 407 but replace description by:

Ground orchids with purplish flowers akin to HABENARIA (q.v.) but with the posterior sepal and petals united as a small rounded hood from beneath which project two spreading sepals. Column very small, and covered by the small labellum which has three arms, one

curled underneath, the other two spreading like two curved horn under the hood. Behind the labellum is a membrane on which lie the stigmas, and which is extended laterally in two narrow ribbons which are curled under and forward at the ends, and cover the base of the anther.

Disperis zeylanica *Trimen*; *F.B.I.* vi 169, CX I. A smaller plant than the next. Lateral sepals concave not waved. t. **527**.

Pulneys: on the downs in the open grass.

Gen. Dist. Ceylon and Western Ghats.

Disperis neilgherrensis *Wt.*; Vol. I p. 407. t. **528**. Pulneys in shade of sholas.

SCITAMINEÆ.

CURCUMA.

See Vol. I p. 408.

HEDYCHIUM.

Hedychium chrysoleucum *Hook*; *F.B.I.* vi 225, as H. coronarium. (See *Kew Bulletin* 1914.) A stout herb growing 4—6 feet. Leaves, a foot by 3 to 5 in. t. **529**. Flowers in an ovoid head.

HÆMODORACEÆ.

OPHIOPOGON.

Ophiopogon intermedius *Don*; Vol. I p. 410. t. **530**.

AMARYLLIDACEÆ.

Vol. I p. 410.

HYPOXIS.

Small plants with globose tuber and narrow leaves all from the ground. Flowers of the normal type for the order, the perianth immediately above the ovary.

Species about 50, chiefly in South Africa.

Hypoxis aurea *Lour.*; *F.B.I.* v 277, I 1. Leaves linear, 4 to 6 inches, hairy. Flowers yellow, solitary, on slender stalks half as long as the leaves. Ovary ¼ inch. Sepals and petals ¼ inch. Anthers sagittate. Capsule ¼ inch to ⅓ inch. t. **531**.

In damp places on the downs. *Fyson* 6546.

Gen. Dist. From Kashmir to South India, Java, China, Japan.

CURCULIGO.

See Vol. I p. 411.

ZEPHYRANTHES.

Zephyranthes carinata *Herb.*; Vol. I p. 412. t. **532**.

LILIACEÆ.

SMILAX.

See Vol. I p. 413 and add:

Smilax macrophylla *Roxb.*; *F.B.I.* vi 310, I 25. Similar to S. Wightii but the main nerves free to the base of the leaf.

Nilgiris: Kotagiri. *Sedgwick* 1610.

Smilax wightii *A.DC.*; *F.B.I.* vi 310, I 26. A large climber armed with a few prickles. Leaves nearly circular, 3 to 5 inches across, shining, cuspidate, leathery. Main veins 3 to 5 from above the base of the leaf. Flowers in umbels, one or two to a peduncle, pedicels ½ inch. Peduncle very stout, 1 to 1 ½ inches with a pair of bracts where it divides. t. **533**.

Nilgiris: 6,000 feet. Common about Coonoor and Wellington.

Smiliax prolifera *Roxb.*; *F.B.I.* vi 312, I 30. A very stout lofty climber, similar to the preceding but the umbels many on a branched peduncle, forming axillary panicles.

Pulneys: Pambar. *Bourne* 3038.

Gen. Dist. Western Himalayas to South India and Ceylon.

ASPARAGUS.

Asparagus fysoni *Macbride*; *Contr. Gray. Herb. Harv. Univ.* 1918 p. 17; Vol. I p. 414, II, t. 262 as A. subulatus, which name belongs by precedence of date to a South African species.

CHLOROPHYTUM.

See Vol. I p. 415.

KEY TO THE SPECIES.

Pedicels jointed near the top	C. heyneanum.
Pedicels jointed about the middle ...	C. attenuatum.
Pedicels not jointed or at the base ...	C. malabaricum.

Chlorophytum heyneanum *Wall.*; *F.B.I.* vi 333, XV 1. Leaves oblanceolate 12 to 18 inches by 1 to ¾ inch. Petioles 2 to 4 inches. Bracts longer than the flowers. Pedicels jointed near the top. Capsule ½ inch long. Seeds black, shining.

Nilgiris: 6,000 feet. (*Clarke*, *F.B.I.*)

Chlorophytum attenuatum *Baker*; *F.B.I.* vi 335, XV 7. Leaves lanceolate acute, 6 to 18 inches. Scape longer. Pedicels jointed at the middle, sepals and petals ¼ inch, capsule ¼ inch broad, obcordate, strongly three-lobed. Seeds ⅛ inch dull black.

Nilgiris: Coonoor, Kotagiri. *Fyson* 6327, 1703; *Sedgwick* 1573.

LILIUM.

Lilium neilgherrense *Wight*; Vol. I p. 416. t. 534.

IPHIGENIA.

Small herbs with a globose rootstock (corm) covered with brown scales. Flowers reddish to dark purple. Stamens opening outwards. Capsule loculicidal.

Species few, in India, Africa and Australasia.

Iphigenia indica *Kunth.*; Corm ½ to ¾ inch diameter. Stem slender 2 to 24 inches, leafy up to the flowers. Leaves linear, 3 to 4 inches only. Perianth parts ¼ to ½ inch very narrowed, dark purple. Capsule ½ inch long, but variable in size. t. **535**.

In grass. Nilgiris: on Coonoor hills, Kotagiri. *Fyson* 6338; *Sedgwick* 1485.

Gen. Dist. Throughout India from the North-Western Frontier to Burma and Ceylon, Australia, Philippines.

EUCOMIS.

Herbs with bulb and spike of flowers, crowned by a tuft of bracts.

Species about 5, all South African.

Eucomis undulata *Willd*; Obviously a garden escape, but apparently naturalized in Neutral Saddle on the Pulneys, 5,300 feet. t. **536**.

COMMELINACEÆ.

See Vol. I p. 419 and add:

Commeliana hirsuta *Clarke*; *F.B.I.* vi 371, II 7. Leaves narrow. Capsule with one cell fertile, other two cells empty and falling off. t. **537**. Wight. Ic. t. 2067.

Pulneys: on the higher downs. *Fyson* 4312. Nilgiris at Neduvattam. *Gamble* 4878.

Commelina glabra *Clarke*; *F.B.I.* vi 371, II 8. Very similar to the above; but glabrous, and grows with it in the grass of the downs. Wight Ic. t. 2067.

Pulneys: 7,500 feet. *Fyson* 4312. Nilgiris, Neduvattam. *Gamble* 14868.

The identifications of my plants quoted in these last two species were kindly made for me by Mr. C. C. Calder, who supplied the references to Mr. Gamble's sheets. Wight first described these as a distinct genus HETEROCARPUS, having

in addition to the special fruit, yellow or orange flowers ; and plants at lower levels, identical in every other respect have flowers so coloured. It looks as if we have here one species with two allelomorphic forms, a glabrous and hairy, and which in addition varies in the colour of its flowers according to altitude.

Commelina clavata *Clarke*; Vol. I p. 419. t. 538.

CYANOTIS.

See Vol. I p. 536.

Cyanotis wightii *Clarke*; Vol. I p. 421. t. 539.

JUNCACEÆ.

Juncus bufonius *Linn*; *F.B.I.* VI 392, I 1. A small densly tufted plant, with very thin needle-like stems and leaves, and pale green flowers, in small axillary cymes. t. 540.

Nilgiris: on damp hill side. Flr. September near Sandy Nullat toll bar. *Fyson.*

Gen. Dist. Native of Northern India, not known here before.

Juncus glaucus *Ehrh.*; Vol. I p. 423. t. 541.
Grows here as robust as J. communis in Europe.

LUZULA.

Luzula campestris *DC.*; Vol. I p. 424. t. 542.

ARACEÆ.

See Vol. I p. 424.

ERIOCAULONACEÆ.

ERIOCAULON.

See Vol. I p. 427 and add :

Eriocaulon oliveri *Fyson*; Vol. I p. 431, II, t. 276. In flower later in the year than E. collinum. Petals of lower male flowers protruding as a fringe, conspicuous when fresh, but not seen when dry.

Eriocaulon geoffreyi *Fyson*; Vol. I p. 432, II, t. 277. Grows on bare patches on the hill sides during rainy weather (September, etc.) solitary; not tufted, and not in swamps.

Eriocaulon thwaitestii *Hook. f.*; Vol. I p. 432, II, t. 277 under name E. Mariæ. *Fyson.*

Eriocaulon horsely-kundæ *Fyson.* Var. megalocephala (to be described in the Records of the Botanical Survey of India). A small plant with the habit of E. Geoffreyi but with larger white heads, and differs from all our other species in the anthers being white or yellowish. t. **543**.

Nilgiris: Ootacamund on slopes of Snowdon. Flr. September. *Fyson* 6560. Coonoor, etc.

CYPERACEÆ.

KYLLINGA.

Not KYLLINGIA. See Vol. I p. 434 and add:

Kyllinga cylindrica *Nees*; *F.B.I.* vi 588, I 2. Similar in habit to K. melanosperma *Nees*, Vol. I p. 434, but heads cylindrical. t. **544**.

CYPERUS.

Including PYCREUS.

See Vol. I p. 435.

Cyperus angulatus *Nees;* **Pycreus angulatus** *Nees; F.B.I.* vi 593, II 11 Stem about 10 inches, black shining. Leaves of 5 to 6 by ⅙ inch. Spikelets ¾ by ⅙ inch, flat, shining dark brown, fascicled sessile at the apex of the stem. Anthers large orange, persistent for a considerable time. t. **545**.

Nilgiris: in swamps on the downs. Flr. September. *Fyson* 6561.

Cyperus rotundus *Linn.*; *F.B.I.* vi 614, a common weed, propagated by small round underground tubers.

Leaves 5 to 8 inch, by 1/6 inch, stem green about 6 inches. Spikelets ovoid, 1/4 inch, in open panicles. Styles three.

Nilgiris : at Coonoor a weed from the plains.

Cyperus digitatus *Roxb.*; Vol. I p. 435. t. **546.**

Cyperus globosus *All.*; **Pycreus capillaris** *Nees* of Vol. I p. 435. t. **243.**

Var. nilagiricus. Spikelets narrower, 1/2 by 1/12 inch, dark chestnut brown. t. **547.**

Kodaikanal. *Fyson* 4220.

Cyperus distans *Linn.*; *F.B.I.* vi 607, III 32. Spikelets very narrow 1/2 by 1/10 inch when young nodding, when mature spreading at right angles, in short spikes disposed in large compound umbels, 6 to 12 inches diameter.

Nilgiris : Kotagiri 6,500 feet. *Sedgwick* 1469. Pulneys : Kodaikanal. *Bourne* 527.

MARISCUS.

Similar to CYPERUS, but the axis (racheola) of the spikelet breaking above the two lowest, empty, glumes.

Mariscus cyperinus *Vahl.*; *F.B.I.* vi 621, V 4. Rhizome hardly any. Lowest sheaths red, not swollen. Leaves 6 to 12 inches by 1/8 inch, as tall as the stem. Spikes 1 inch long, about 7 to 10 sessile at the top of the stem, bracts below them leaflike, 4 to 6 inches. Spikelets cylindrical, very thin, 1/4 by 1/50 inch, sloping slightly upwards, very numerous and forming a compact cylindrical spike. t. **548.**

Nilgiris : Coonoor hill sides in grass.

Gen. Dist. North-West India to Ceylon.

For ELÆOCHARIS and FIMBRISTYLIS. See Vol. I p. 456.

SCIRPUS.

See Vol. I p. 439.

Scirpus mucronatus *Linn.*; Vol. I p. 439. t. **549.**

Scirpus subcapitatus *Thw.*; Vol. I p. 440. t. **550.**

CAREX.

See Vol. I p. 441.

Carex phacota *Spreng*; *F.B.I.* vi 708, XXVIII 23. Spikes cylindrical about 2 by ⅙ inch, each on a slender peduncle, the lower thicker parts of the spike of female flowers, the upper thinner part of male only. Upper leaves on bracts of the flower 6 to 8 inches. t. **551**.

Pulneys: 7,000 feet. *Fyson* 4218, 4252; *Bourne* 1214.

Gen. Dist. Himalayas, Khasia hills, and to South India, Ceylon, Assam, Malay Islands and Japan.

Carex filicina *Nees*; Vol. I, p. & * &. A tall plant of 3 or 4 feet. Upper leaves 4 to 10 inch acute. Spikes numerous, ¼ inch long each, in panicles of about 2 inches by 1 inch, peduncled in the leaf axils, the whole formed a large panicles more than half the height of the plant. t. **552**.

On both plateaus: Pulneys near Kodaikanal, Villpatti, etc. *Fyson* 4253, 4129; *Bourne* 1215.

Gen. Dist. From Khasia hills to Pulneys and Ceylon, China and Japan.

Carex myosurus *Nees*; *F.B.I.* vi 723, XXVIII 68. Spikes about 2 inches long the upper ¾ inch (male) distinctly thinner than the lower female glume or about ⅛ inch awned, with three ribs down the centre, urticle not longer. t. **553**.

Nilgiris: Coonoor. *Fyson* 6331 in light shade. These hills only.

GRAMINEÆ.

PASPALUM.

See Vol. I p. 444.

See Vol. I p. 447.

ISACHNE.

Isachne kunthiana *W. & A.*; Vol. I p. 449. A slenderer plant than the next species, distinctly hairy

with hairs on bulbous bases. Glumes i and ii purple and distinctly longer than iii and iv which show white between them. The purple and white spikelets being a feature of the grass. t. **554**.

Isachne australis *Br.*; Vol. I p. 448. Leaves narrower and shorter than in the preceding species, acute. Glumes i and ii not much longer than iii and iv with seven or nine nerves and hairs between them. t. **555.**

Isachne gardneri *Benth.*; Vol. I p. 448. t. **556**.

A stouter coarser plant of wet places.

PANICUM.

See Vol. I p. 449 and add :

Panicum villosum *Lamk.*; *F.B.I.* vii 34, IV 10. Stems prostrate hairy. Leaves ovate-oblong, densely pubescent on both surfaces. Spikelets irregularly arranged on the branches of a narrow panicle, very small. Glume; very short, nerveless; gl. ii ovate acute seven-nerved; gl. iii ovate-oblong gl. iv abruptly apiculate. t. **557**.

Nilgiris: Coonoor by roadsides in shade.

OPLISMENUS.

Oplismenus undulatifolius *Beauv.*; Vol. I p. 449. t. **558**.

ARUNDINELLA.

See Vol. I p. 451.

Arundinella fuscata *Nees*; Vol. I p. 452. t. **559**.

SETARIA. F.B.I. 173 XIII

Spikelets 1 or 2-flowered, unawned, crowded in a dense (really compound) spike, and each surrounded by a ring of bristles.

Species few.

Setaria glauca *Beauv.*; *F.B.I.* vii 78, XIII 2. Stem 1 to 2 feet. Leaves broad or narrow, flat.

Spike ½ to 7 inches long, ovoid to cylindrical, bristly the spikelets each with 6 to 12 barbed bristles. Glume i minute; gl. ii shorter than iii which is empty or with stamens only; gl. iv broadly ovoid, very convex and transversely ridged. t. 560.

In grass, especially in gardens, etc.
Gen. Dist. Throughout India.

POLLINIA.

See Vol. I p. 452.

Pollinia quadrinervis *Hack.*; Vol. I p. 452. t. 561.

ISCHÆMUM.

Ischæmum ciliare *Retz.*; Vol. I p. 454. t. 562.

ANDROPOGON.

See Vol. I p. 455.

CHRYSOPOGON.

See Vol. I p. 456.

Tall handsome grasses with open panicles of coloured spikelets.

Stigmas yellow. Plant glabrous or nearly so, awn 2 in. red C. wightianus.
Stigmas purple. Plant pubescent, awn 1 in. C. zeylanicus.

Chrysopogon wightianus *Nees*; Vol. I p. 456. Panicles very handsome, the yellow anthers and stigmas conspicuous against the purple glumes. In dry places.

Chrysopogon zeylanicus *Thw.*; Vol. I p. 457. Outer side of spikelets purple, inner sides greenish, giving the whole panicle a mixed purple and pale greenish appearance. Stigmas purple. t. 563. By streams.

HETEROPOGON.

Heteropogon contortus *Beauv.*; Vol. I p. 457. Stark's head. Distinct from all other of our grasses by its grey

curved spike which ends in a fine point formed by several twisted together. t. 564.

Abundant all over the downs. Fls. June.

CYMBOPOGON.

See Vol. I p. 457.

Cymbopogon polyneuros *Stapf.*; Vol. I p. 458. t. 565.

Cymbopogon lividus *Stapf.*; Vol. I p. 458. t. 566.

ANTHISTIRIA.

See Vol. I p. 459.

Involucral spikelets 1/5 to ¼ in.; bisexual spikelets ⅛ to 1/5 in.; bristles on large bulbous bases (Vol. I p. 459. t. 567). A. ciliata.

Involucral spikelets ⅓ to ½ in.; bisexual spikelets ¼ to 1/5 in; bulbous bases of hairs small and few . . A. imberbis.

Anthistiria imberbis *Retz.*; *F.B.I.* vii 211, LIV II. Similar to A. ciliata, and very variable, but the spikelets larger as indicated in the key above.

Nilgiris: At lower levels in dry places.

CALAMOGROSTIS.

Calamogrostis pilosula *Hook. f.*; Vol. I p. 460. t. 568.

ZENKERIA. F.B.I. 173 LXXVII.

Perennial long-leafed grasses, with small two-flowered spikelets in open panicles, not jointed to their pedicels. Rachilla (axis of spikelet) jointed at the hairy base, and not produced beyond gl. iv. Glumes i and ii (empty) one-nerved; gls. iii and iv, equal many-nerved.

Zenkeria elegans *Trin.*; *F.B.I.* vii 270, LXXVII I. A very pretty grass with pink spikelets. t. 569.

Common on rocks or in stony places on both plateaus.

CŒLACHNE.

Cœlachne pulchella *Br.*; Vol. I p. 460. t. 570.

TRIPOGON.

See Vol. I p. 462.

Flowering glumes simply divided, with an awn between. T. jacquemontii.

Flowering glumes with four lobes, the outer small and awned, and short central awn . . . . T. bromoides.

Tripogon jacquemontii *Stapf.*; *F.B.I.* vii 286, LXXXVII 6. Stem slender 1 to 2 feet. Leaves filiform, spikes 6 to 10 inches slender. Spikelets ⅛ to ¾ inch with 10 to 20 flowers. Gl. i, lanceolate, much smaller than gl. ii, which is two toothed, below the tip. Gl. iii, etc., two lobed, the lobes not awned, central awn straight [*F.B.I.*].

Nilgiris: ? Kotagiri *Sedgwick*.

Gen. Dist. Konkan and Deccan, Bengal.

Tripogon bromoides *Roth*; Vol. I p. 462.

Occurs on the downs in two distinct forms, side by side.

Var. **major** *Stapf.* Stem 2 to 4 feet. Lower leaves 5 to 6 inches narrow but flat. Spike 4 to 8 inches. Spikelets ⅔ inch. t. **571**.

Var. **longifolius**. Stem ½ to 2 feet. Leaves filiform as long as or shorter than the stem. Spikes 3 inches. Spikelets ⅓ inch.

ERAGROSTIS.

See Vol. I p. 462.

Spikelets, few, half or broad as long, purplish. E. amabilis.

Spikelets, many narrow, greenish or black. . . . .

Glume i on minute ii nearly = iii; anthers brown. E. willdenoviana.

Gl. i minute = ¼ iv; remainder obtuse: anthers violet. E. tenuifolia.

Gl. i and ii = iii or longer: remainder acute: anthers yellow. . . . . E. nigra.

Eragrostis amabilis *W. & A.*; Vol. I p. 463. Variable in size and the number of its spikelets, the panicle containing as few as 3 or as many as 20. Spikelets pinkish to dark purple, flat. Common in gardens and in short grass. t. **572**.

Eragrostis willdenoviana *Nees*; *F.B.I.* vii 322, CIV 18. Stem 4 to 18 inches slender. Leaves short flat. Panicle 1 to 3 inches. Spikelets olive grey or greenish, ⅙ to ¼ inch long, very narrow. t. **573**.

Eragrostis tenuifolia *Hochst*; Vol. I p. 463. t. **574**.

Eragrostis nigra *Nees*; Vol. I p. 464. Spikelets ⅙ by ⅛ inch, olive grey, the two lowest glumes as long or longer than the others, and acute. t. **575**.

BRIZA.

Briza media *Linn*; Vol. I p. 464. t. **576**.

Briza major *Linn*; Job's tears. t. **577, 578**.

A garden plant, occasionally established as an escape.

POA.

Poa annua *Linn*; Vol. I p. 465. t. **579**.

BROMUS.

See Vol. I p. 465.

FESTUCA.

Perennial grasses with flat, rolled or narrow leaves and open or narrow panicles of many flowered spikelets. Flowering glumes rounded on the back, keeled towards the tip only.

Festuca bromoides *L.* An introduction from Europe. t. **580**.

BRACHYPODIUM.

See Vol. I p. 466.

APPENDIX.

BRYOPHYLLUM.

Shrubby plants with opposite, simple or whorled fleshy leaves. Flowers in terminal panicles. Calyx and corolla both tubular, four-lobed. Stamens 8, attached to the base of the (monopetalous) corolla. Carpels 4, quite free of each other, each with a slender straight style without stigmatic head. Fruit of many follicles.

Species mostly in Mexico.

Bryophyllum pinnatum *Kurz* Stem four-angled. Leaflets 3 to 7, ovate to obovate, 2 to 3 inches long by 1½ to 2 inches, crenate and with bristles in the notches. Panicle 3 to 4 feet high, the branches opposite and flowers well separated. Calyx 1¼ inch long, pale yellowish green with reddish base. Corolla ¾ inch longer, reddish-brown towards the tips of the lobes. Stamens of different lengths shorter or longer than the styles.

A native of Mexico. Nilgiris: Coonoor, Kotagiri, etc.

Bryophyllum calycinum *Salisb.* very similar to the above and possibly the same species, but with usually simple leaves 4 to 5 inches long is frequent in Madras and the drier parts of Mysore. The leaves readily sprout at the notches if hung up separately, or if immersed in water.

Memecylon lushingtonii Gamble in Kew Bull. 1919 p. 227. A small tree or shrub. Leaves shortly stalked, oblong elliptic obtuse, notched at the apex, about 1½ by ⅝ inch. Cymes dense sessile. Flowers pale blue.

Nilgiris: near Coonoor below 6,000 feet.

Gen. Dist. From the Ceded Districts southwards.

LEGUMINOSEÆ-PAPILIONACEÆ.

Desmodium rotundifolium *Baker*; *F.B.I.* ii 172, L 40. A small plant with very slender stems and younger branches covered with sticky hairs. Leaves of one or of three leaflets intermixed, the lateral leaflets much smaller than the middle one, which varies from ¼ to 1 inch, and is nearly round; stipules, petioles and margin of leaf with long brown hairs. Racemes, slender terminal: pedicels often in pairs, very slender ½ to 1 inch, erect. Sepals strongly veined and shaggy with brown hairs. Corolla pink. Pod distinctly constricted between the seeds.

Nilgiris: on the downs on moist hill side. Flr. September. *Fyson* 6568 (figured) also on Western Ghats at 3,500 feet.

Gen. Dist. Plains of Concan (F.B.I.).

LEGUMINOSEÆ-CÆSALPINEÆ.

Acrocarpus fraxinifolius *Wight*; *F.B.I.* ii (1/2 inch space) a lac leaves doubly pinnate of about 5 pinnate 12 inches long each of about 8 pairs of leaflets. Leaflets 2½ to 3½ inches by 1¼ to 2 inches, obovate, cuspidate, entire, glabrous. Flowers in stiff spikes 5 to 10 inches long. Calyx ¼ inch, shallow-cup shaped. Corolla ½ inch, cream-coloured stamens 10, filaments red very conspicuous fruit.

Nilgiris: Coonoor possibly only planted, at bridge at foot of Tiger Hill Road, Sims Park, etc. Flr. March-April.

Gen. Dist. Lower levels on these hills.

Osbeckia *Sp.* (p. 49).

Mr. Ranga Achariyar, the Government Lecturing and Systematic Botanist, who is in charge of the Madras Herbarium at Coimbatore, tells me that this plant has hitherto been regarded as a variety of O. octandra, and was apparently so considered by Gamble in the F.M.P. pt. 3, for no reference is made to it; but that he himself thinks it is probably a good species. The petals and calyx-lobes, as may be seen in the figure, vary from 4 to 5, on the same plant. The colour is quite distinctly a pure pink, whereas O. octandra is described in G.F.M.P. as having purple flowers.

MICROTROPIS.

Erratum.—The colour of the *fruit* given in Vol. I p. 79, etc., should read colour of *seed.*

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ILLUSTRATIONS

BY

MRS. FYSON

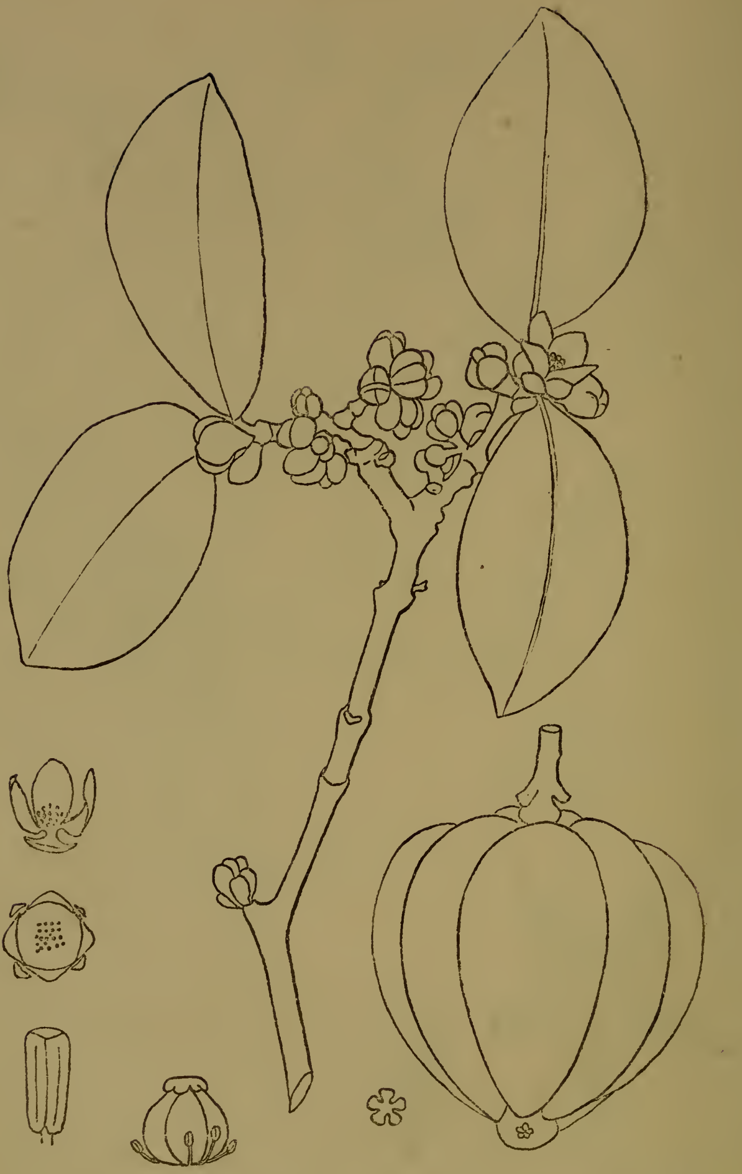
AND OTHERS

D. R. Fyson del. SCOLOPIA CRENATA *Clos.* ½ Nat.

* Continued from volume II.

D. R. Fyson del. HYDNOCARPUS ALPINA *Wt.* ½ Nat.

D. R. Fyson del. POLYCARPON TETRAPHYLLUM *L.*
Nat. size.



D. R. Fyson del. GARCINIA CAMBOGIA *Desrous.* ½ Nat.

D. R. Fyson del. SIDA RHOMBOIDEA *Roxb.* **Nat. size.**

Mrs. E. W. Stoney del. URENA LOBATA *L.* Nat. size.

D. R. Fyson del. ELÆOCARPUS MUNROII *Mast.* ½ Nat.

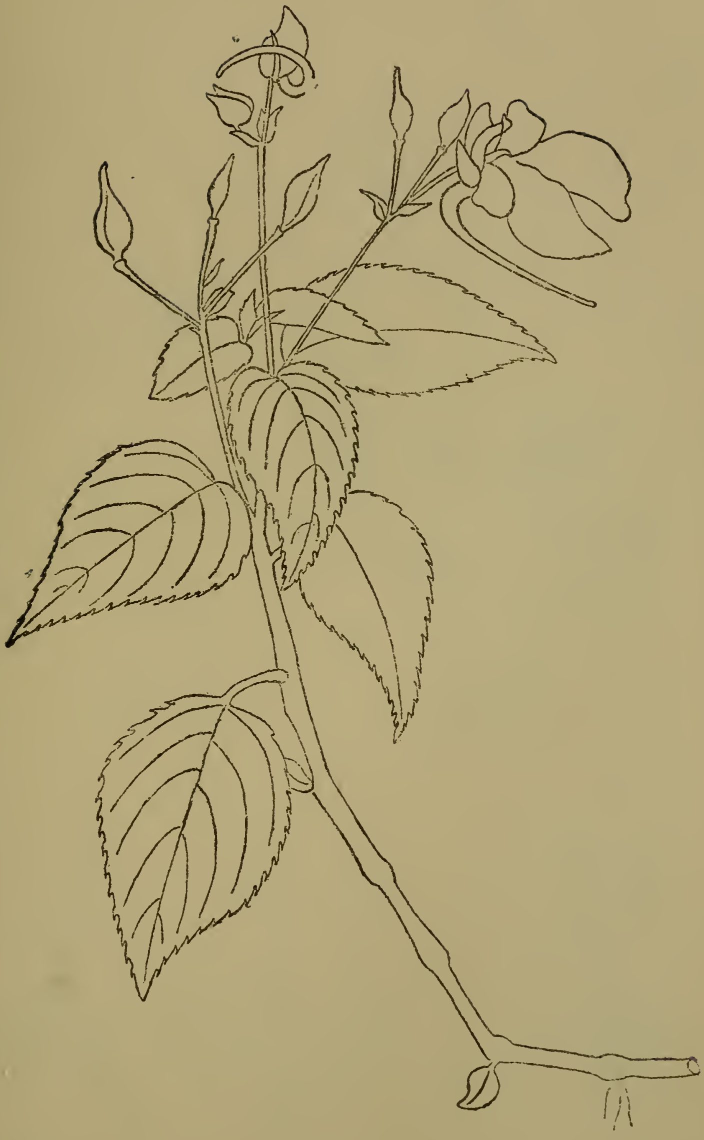
D. R. Fyson del. GERANIUM NEPALENSE *Sweet.* ¾ Nat.

D. R. Fyson del. BIOPHYTUM INTERMEDIUM *Wt.* Nat. size.

D. R. Fyson del. IMPATIENS SCAPIFLORA *Heyne.* $\frac{2}{3}$ Nat.

D. R. Fyson del. IMPATIENS HENSLOWIANA *Arn.* ¾ Nat.

D. R. Fyson del. IMPATIENS FRUTICOSA *DC.* $\frac{2}{3}$ Nat.



D. R. Fyson del. IMPATIENS VISCIDA *Wight.* Nat. size.

D. R. Fyson del. IMPATIENS CAMPANULATA *Wight.* ½ Nat.

D. R. Fyson del. EVODIA LUNUR-ANKENDA *Merr.* ½ Nat.

D. R. Fyson del. ACRONYCHIA LAURIFOLIA *Bl.* ½ Nat.

D. R. Fyson del. HEYNEA TRIJUGA *Roxb.* ½ Nat.

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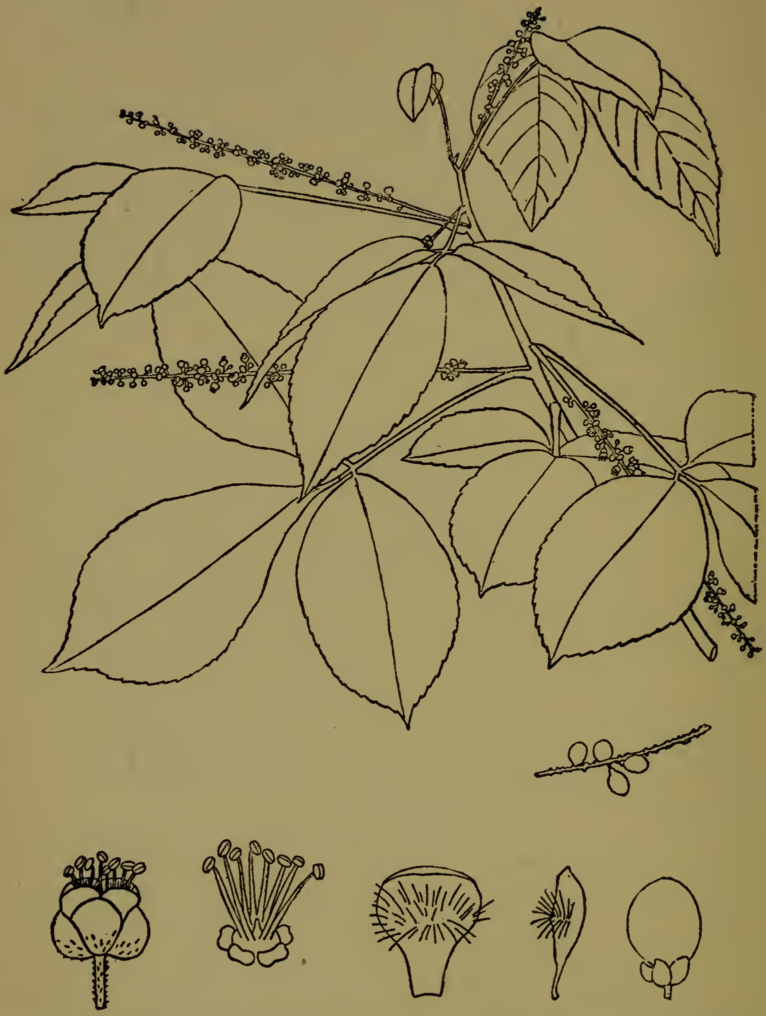
D. R. Fyson del. GOMPHANDRA CORIACEA *Wight.* ⅔ Nat.

D. R. Fyson del. ILEX DENTICULATA *Wall.* Nat. size.

D. R. Fyson del. GYMNOSPORIA OVATA *Lawson.* ½ Nat.

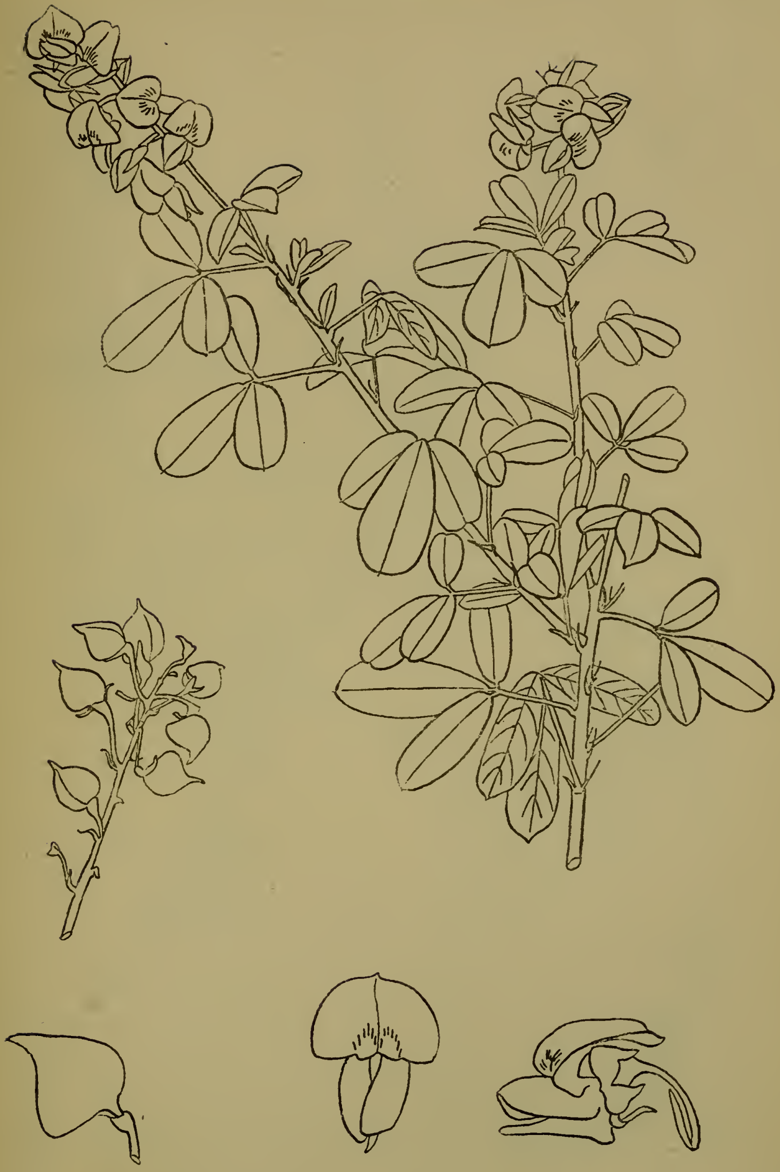
D. R. Fyson del. TETRASTIGMA MURICATUM *Gamble.*
½ Nat.



D. R. Fyson del. ALLOPHYLUS SERRATUS *Radlk.* ½ Nat.

D. R. Fyson del. CROTALARIA CALYCINA Schrank. ¾ Nat.

D. R. Fyson del. CROTALARIA LESCHENAULTII *DC.* ½ Nat.

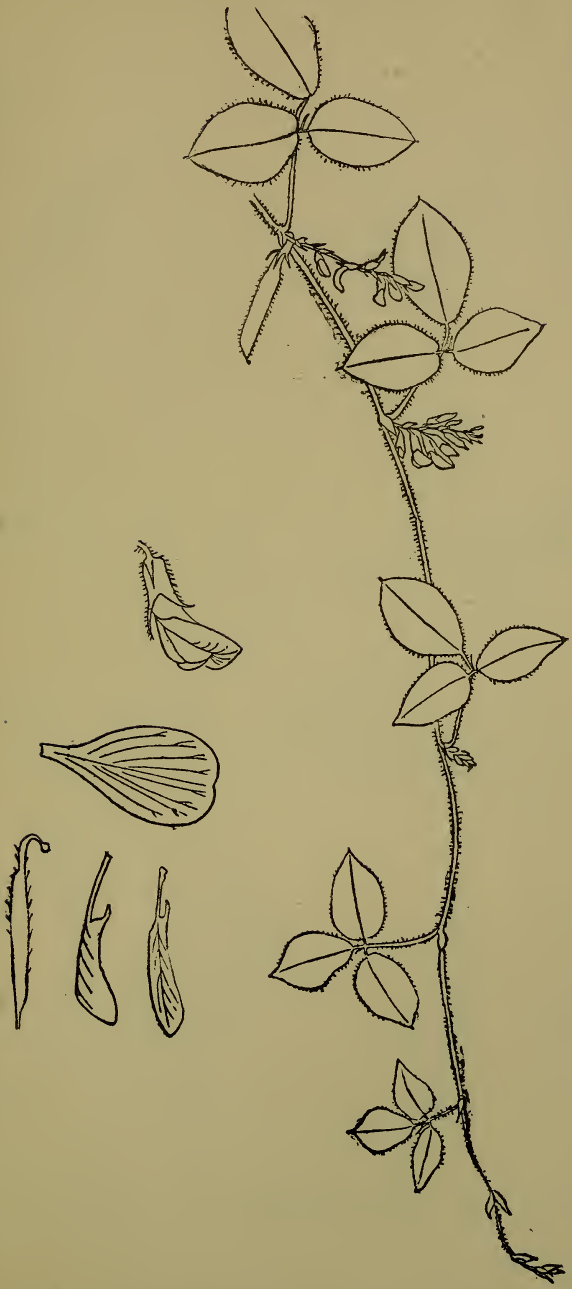


D. R. Fyson del. CROTALARIA NOTONII *W. & A.* ½ Nat.

D. R. Fyson del. INDIGOFERA PULCHELLA *Roxb.* ½ Nat.

D. R. Fyson del. DESMODIUM RUFESCENS *DC.* ½ Nat

D. R. Fyson del. ALYSICARPUS PARVIFLORUS *Dalz.* Nat. size.



D. R. Fyson del. SHUTERIA VESTITA *W. & A.* ½ Nat.

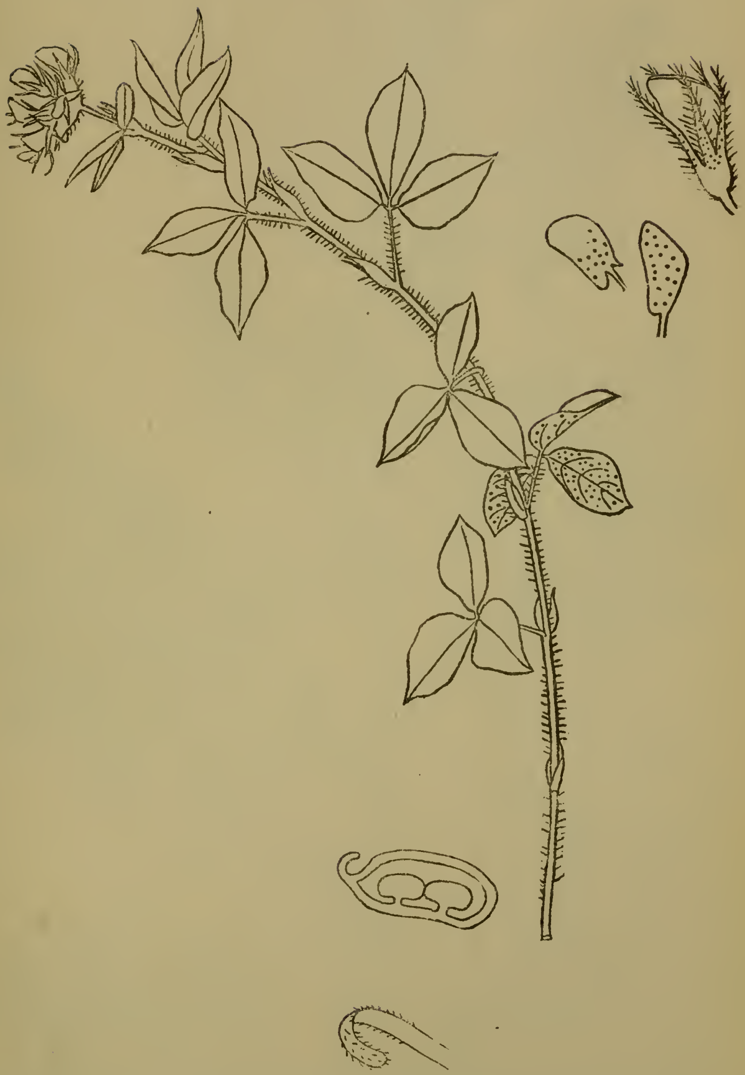
⅔ Nat.

DUMASIA VILLOSA *DC.*

D. R. Fyson del.

D. R. Fyson del. ATYLOSIA RUGOSA *W. & A.*

D. R. Fyson del. FLEMINGIA GRAHAMIANA *W. & A.* ¾ Nat.



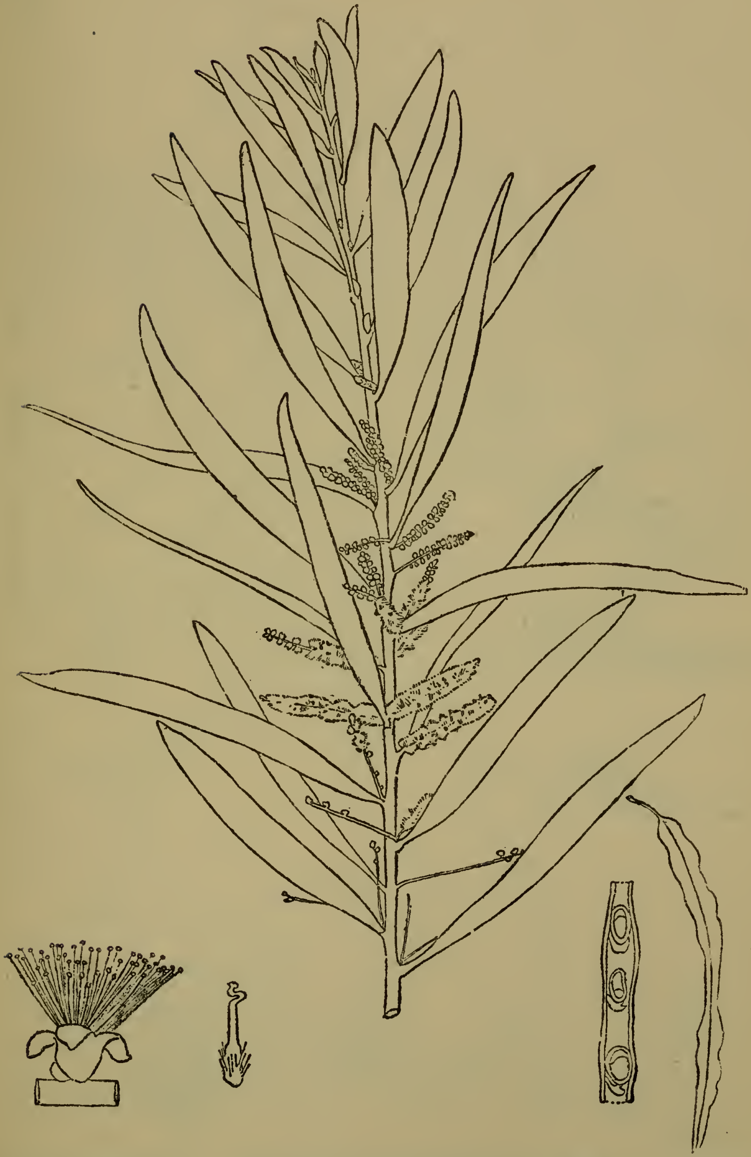
D. R. Fyson del. FLEMINGIA NILGHERIENSIS *Wt.* ½ Nat.

3

D. R. Fyson del. DERRIS CANARENSIS *Baker.* $\frac{2}{3}$ Nat.

D. R. Fyson del. CÆSALPINIA SEPIARIA *Roxb.* ½ Nat.

D. R. Fyson del. CASSIA LESCHENAULTIANA *DC.* ½ Nat.



D. R. Fyson del. ACACIA LONGIFOLIA *Willd.* ⅔ Nat.

D. R. Fyson *del.* PYGEUM GARDNERI *Hook. f.* ½ Nat.

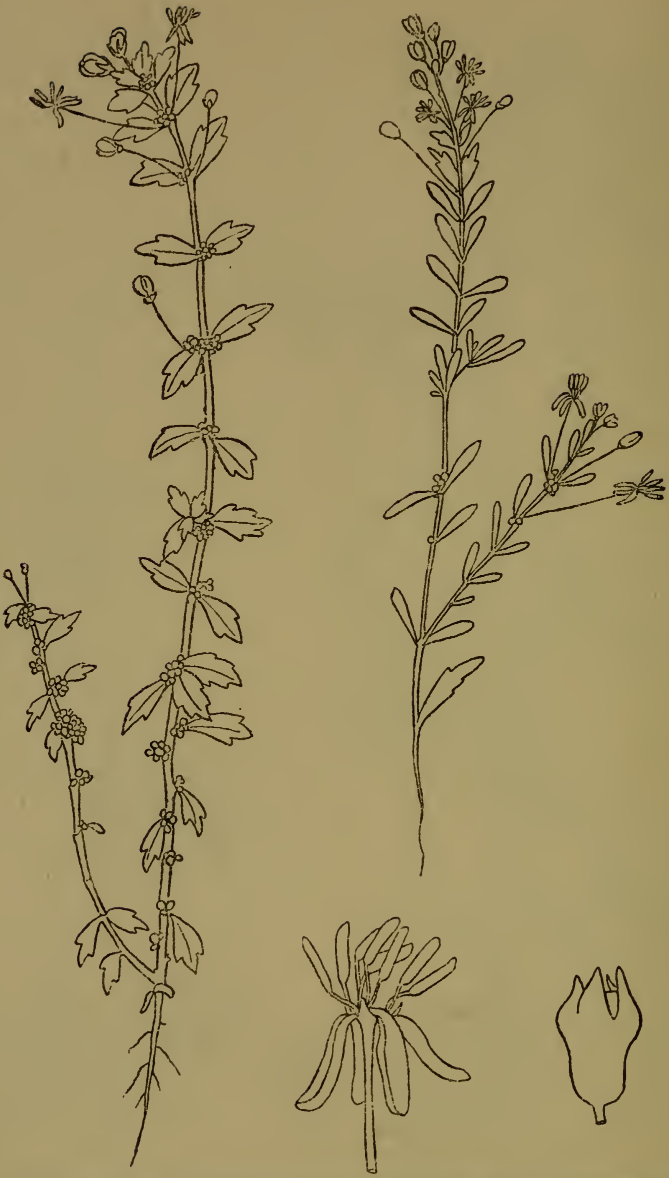
D. R. Fyson del. FRAGARIA INDICA *Andr.* ½ Nat.

D. K. Fyson del. FRAGARIA NILGERRENSIS *Schlecht.* ½ Nat.

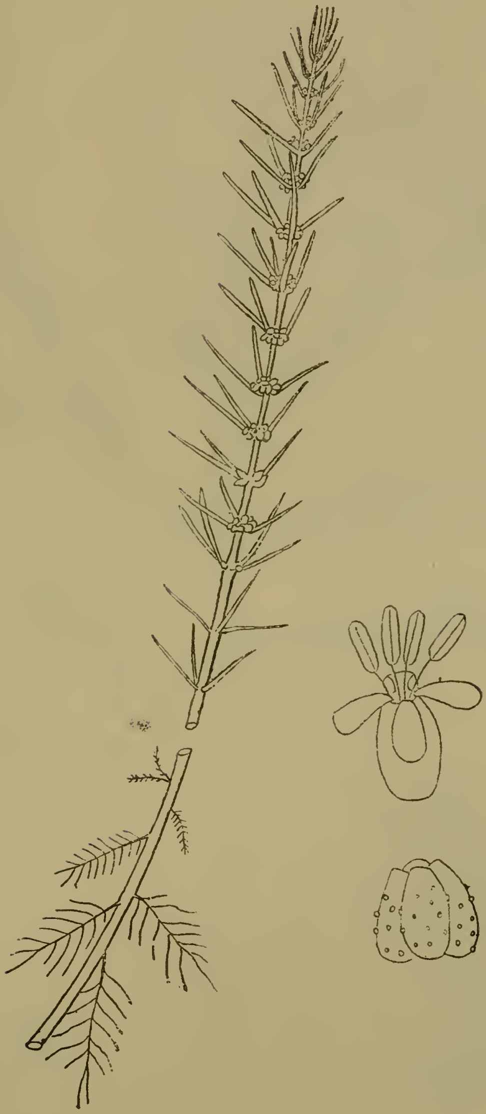
D. R. Fyson del. PHOTINIA NOTONIANA *W. & A.* ½ Nat.

D. R. Fyson del. COTONEASTER BUXFOLIA *Wall.* $\frac{2}{3}$ Nat.

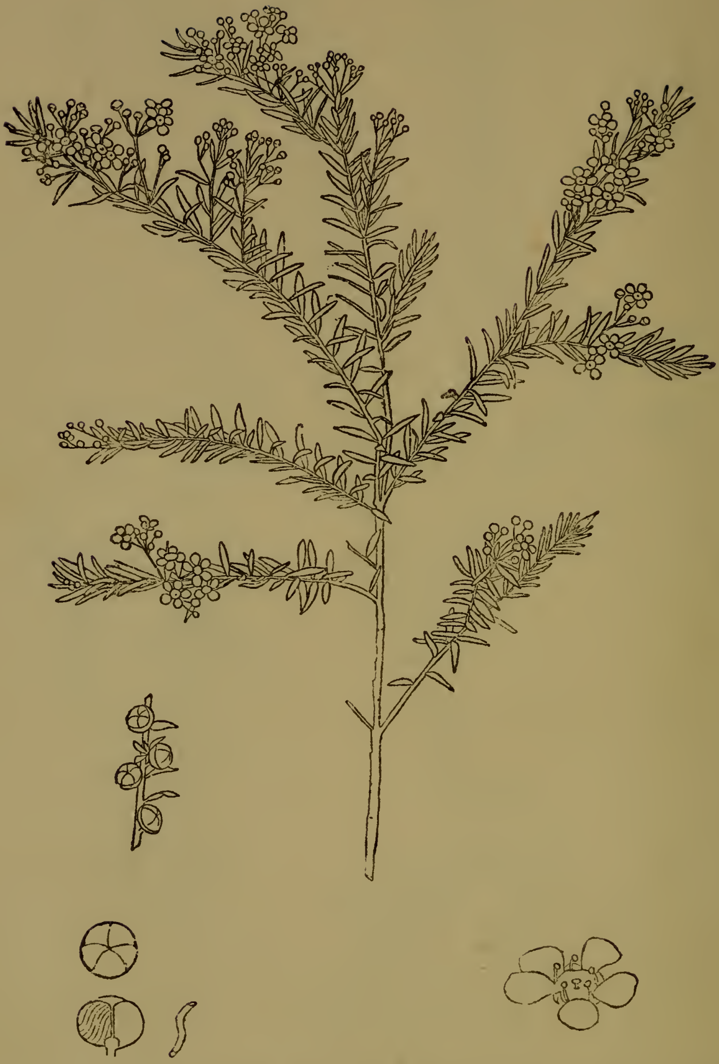
D. R. Fyson del. PARNASSIA WIGHTIANA *Wall.* Nat. size.



D. R. Fyson del. SERPICULA BREVIPES *W. & A.* **Nat. size.**



D. R. Fyson del. MYRIOPHYLLUM INTERMEDIUM *DC.*
¾ Nat.



D. R. Fyson del. BÆCKEA VIRGATA *Anders.* ½ Nat.

D. R. Fyson del. EUCALYPTUS GLOBULUS *Lab.* 1/3 Nat. size

D. R. Fyson del. SYZYGIUM JAMBOLANA *DC.* ½ Nat.

D. R. Fyson del. OSBECKIA RETICULATA *Bedd.* ½ Nat.

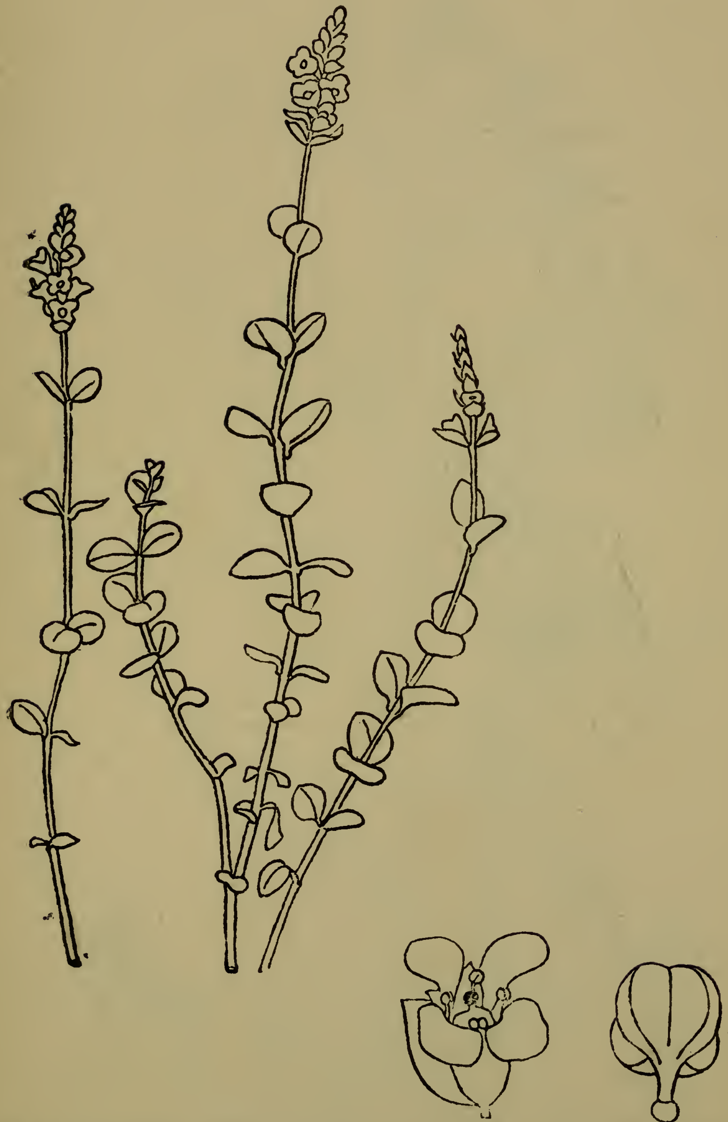
D. R. Fyson del. OSBECKIA *Sp.*

Mrs. W. E. Stoney pinxit.

SONERILA SPECIOSA *Zenk.* Nat. size.

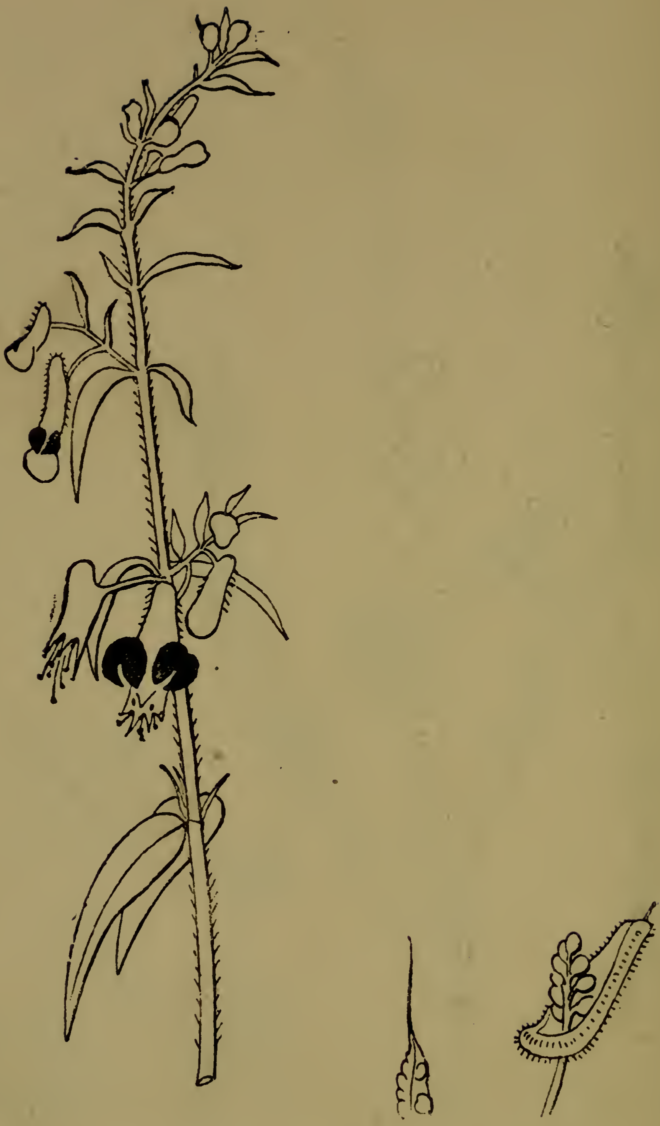
D. R. Fyson del.

MEMECYLON MALABARICUM, *Cogn.* ½ Nat.



D. R. Fyson del.

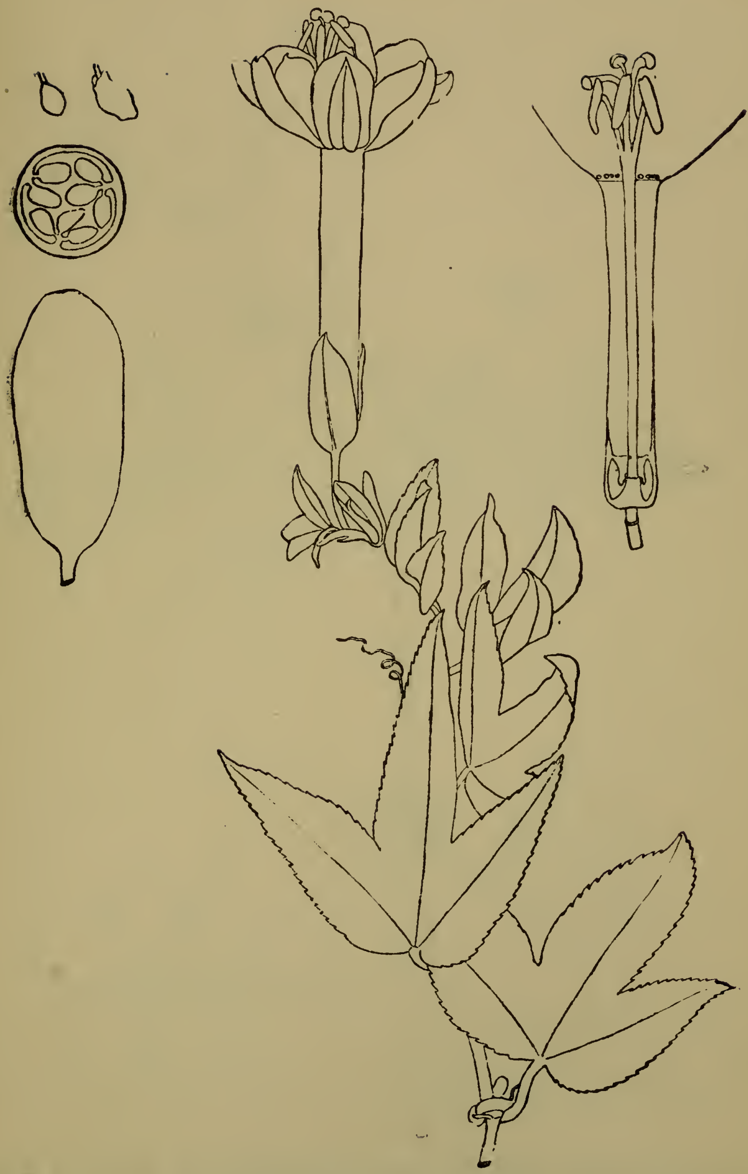
ROTALA ROTUNDIFOLIA, *Koehne.* **Nat. size.**



D. R. Fyson del. CUPHEA PINETORUM *Benth.* Nat. size.

D. R. Fyson del. ŒNOTHERA ROSEA *Ait.* Nat.

D. R. Fyson del. CIRCÆA ALPINA *L.* Nat. size.

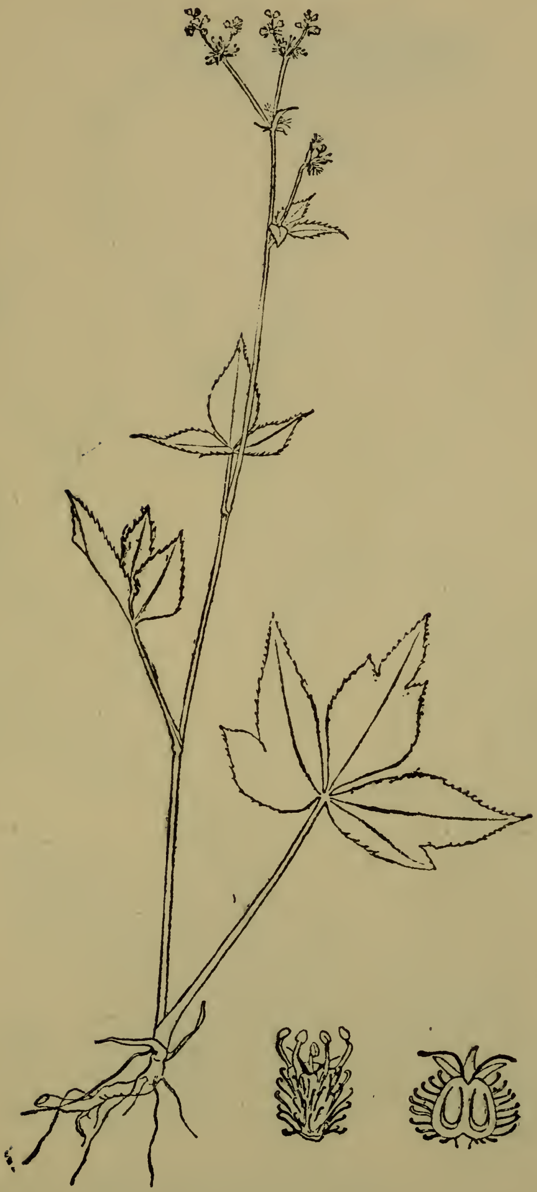


D. R. Fyson del. TACSONIA MOLLISSIMA *H.B. & K.* ½ Nat.

D. R. Fyson del. MELOTHRIA LEIOSPERMA *Cogn.* ½ Nat.

D. R. Fyson del. HYDROCOTYLE ROTUNDIFOLIA *Roxb* Nat. size.

P. F. *Fyson del.* CENTELLA ASIATICA *Urban.* Nat. size.



D. R. Fyson del. SANICULA EUROPÆA *L.* Nat. size.

D. R. Fyson del. HERACLEUM RIGENS *Wall.*

D. R. Fyson del. HERACLEUM CEYLANICUM *Gardn.* $\frac{2}{5}$ **Nat.**

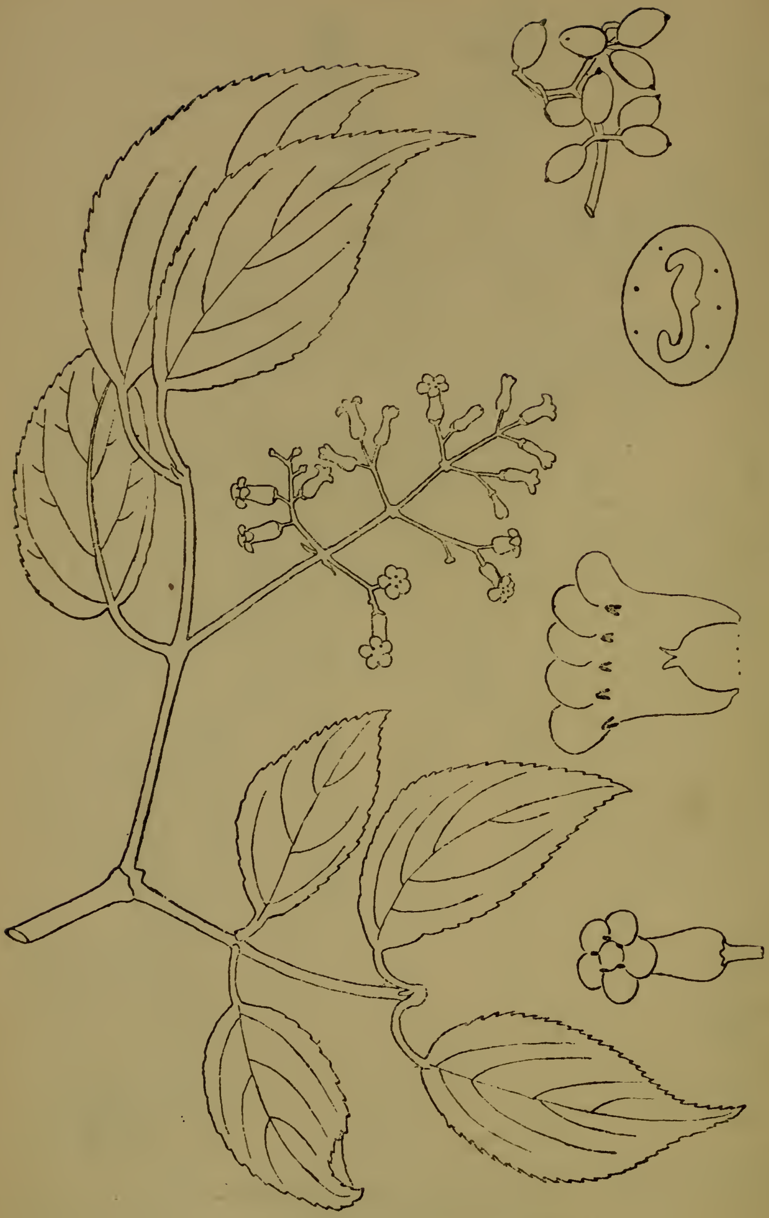
D. R. Fyson del.

HERACLEUM SPRENGELIANUM *W. & A.* $\frac{2}{5}$ Nat.

D. R. Fyson del. SCHEFFLERA RACEMOSA Harms.

D. R. Fyson del. SCHEFFLERA STELLATA *Harms.* ½ Nat.

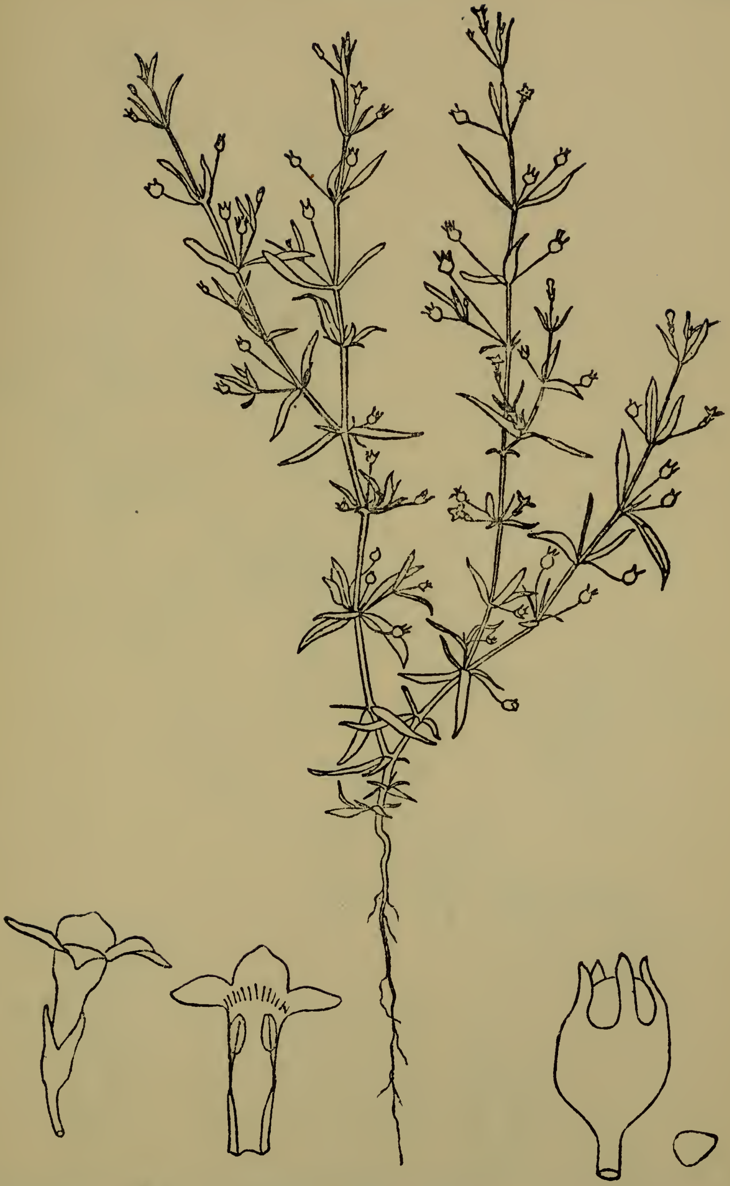
D. R. Fyson del. VIBURNUM CORIACEUM. *Blume.*
Var. CAPITELLATA.



P. F. Fyson *del.* VIBURNUM ERUBESCENS *Wall.* Var. WIGHTIANA. $\frac{3}{4}$ Nat. size.

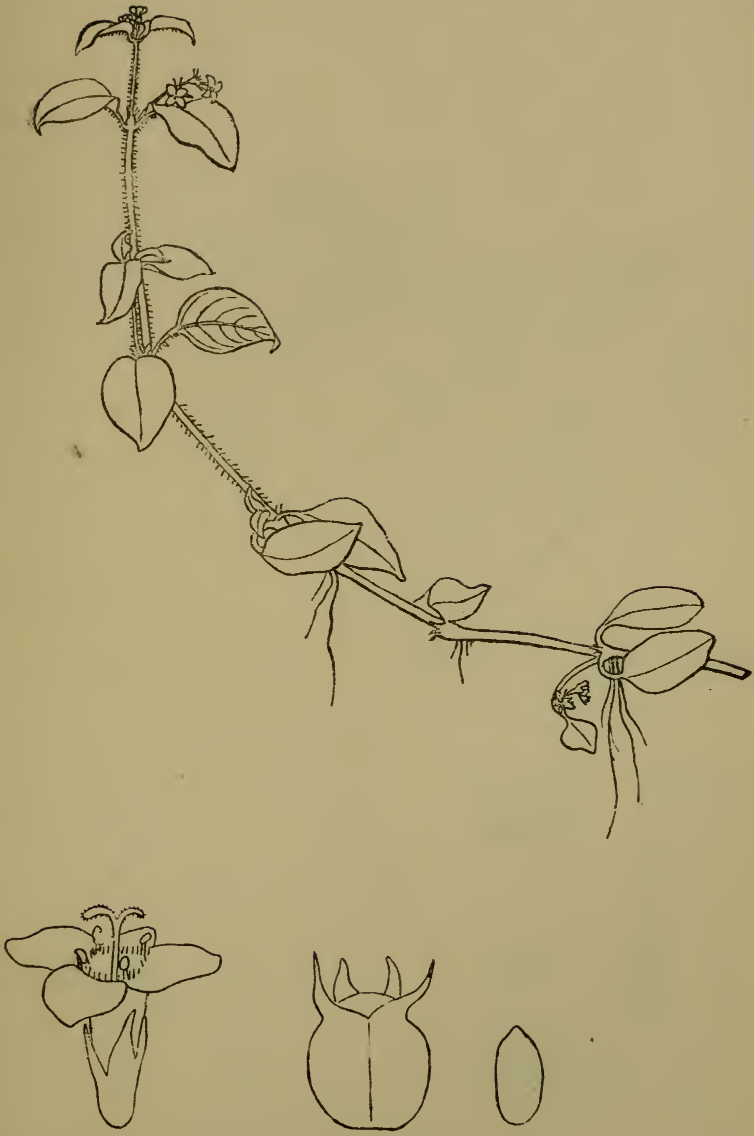
D. R. Fyson del. WENDLANDIA NOTONIANA *Wall.* ½ Nat.

D. R. Fyson del. HEDYOTIS SWERTIOIDES *Hk. f.* $\frac{2}{3}$ **Nat.**



D. R. Fyson del. OLDENLANDIA HEYNII *Br.* Nat. size.

D. R. Fyson del. ANOTIS WIGHTIANA *Hook. f.* Nat. size.



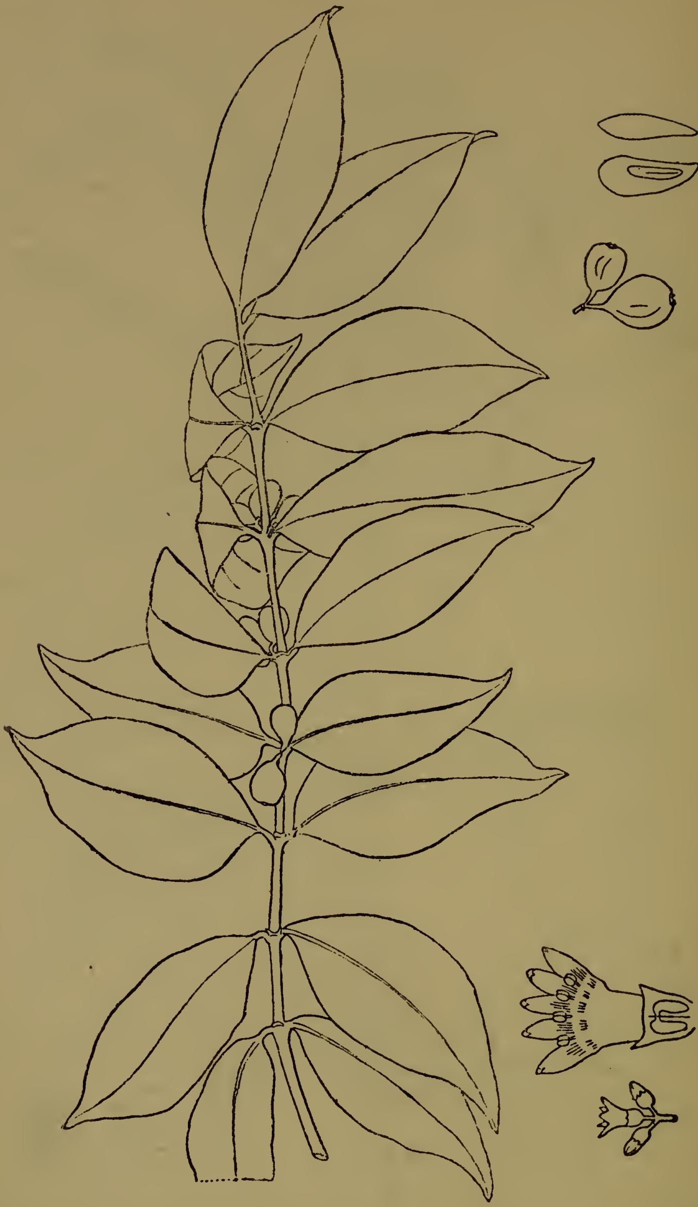
D. R. Fyson del. ANOTIS MONOSPERMA *Hook. f.* ½ Nat.

P. F. Fyson del. OPHIORRHIZA BRUNONIS *W. & A.* ½ Nat.

D. R. Fyson del. WEBERA CORYMBOSA *Willd.* Nat. size.

D. R. Fyson del. KNOXIA MOLLIS *W. & A.*

R. Natesan del. KNOXIA WIGHTIANA *Wall.*



½ Nat.

CANTHIUM NEILGHERRENSIS *Wt.*

D. R. Fyson del.

D. R. Fyson del. PAVETTA BREVIFLORA *DC.* ½ Nat.

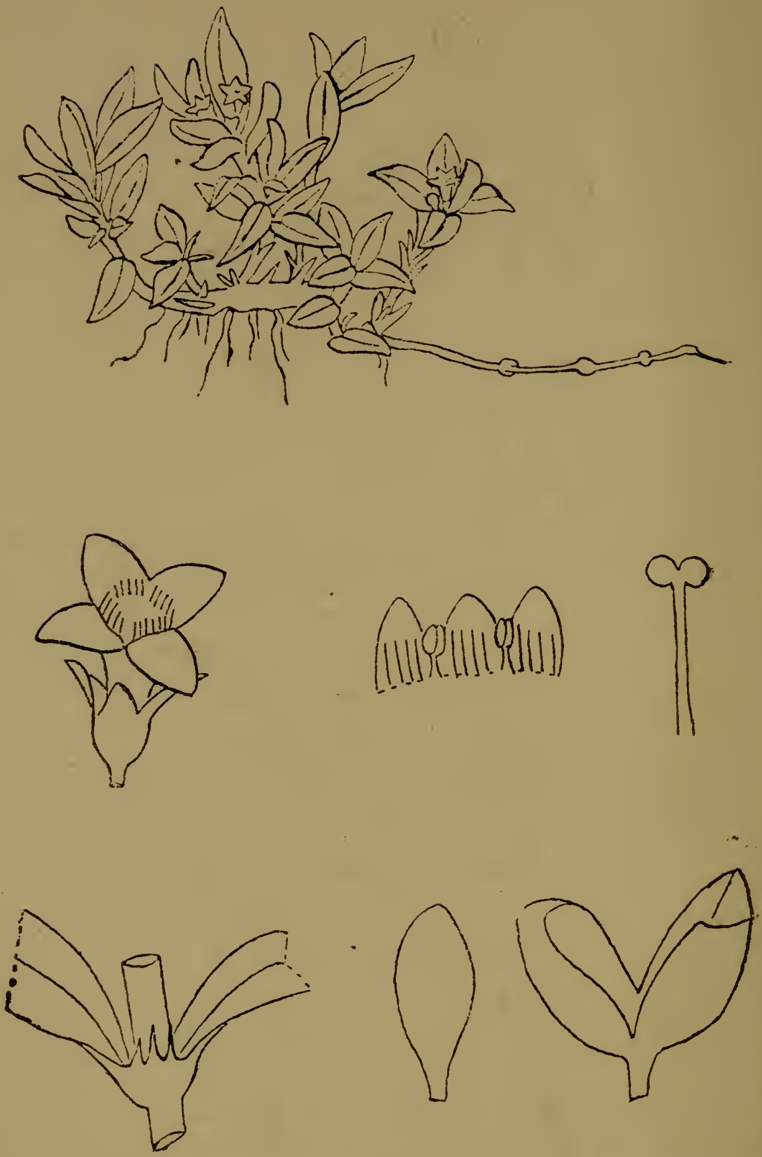
D. R. Fyson del. PSYCHOTRIA CONGESTA *W. & A.* ½ Nat.

D. R. Fyson del. PSYCHOTRIA ELONGATA *Wight.* ½ Nat.

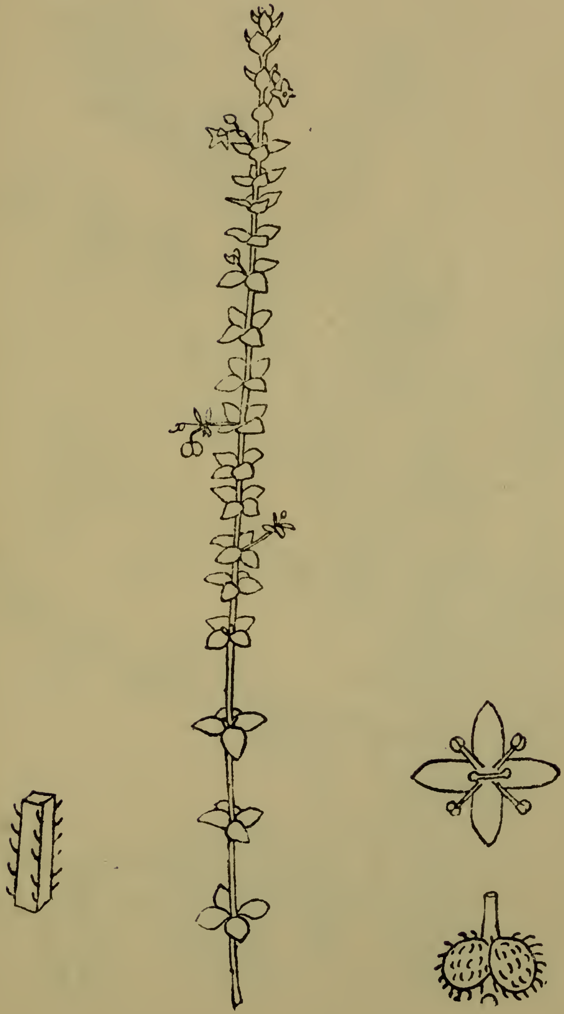
6

D. R. Fyson del. PSYCHOTRIA BISULCATA *W. & A.* ½ Nat.

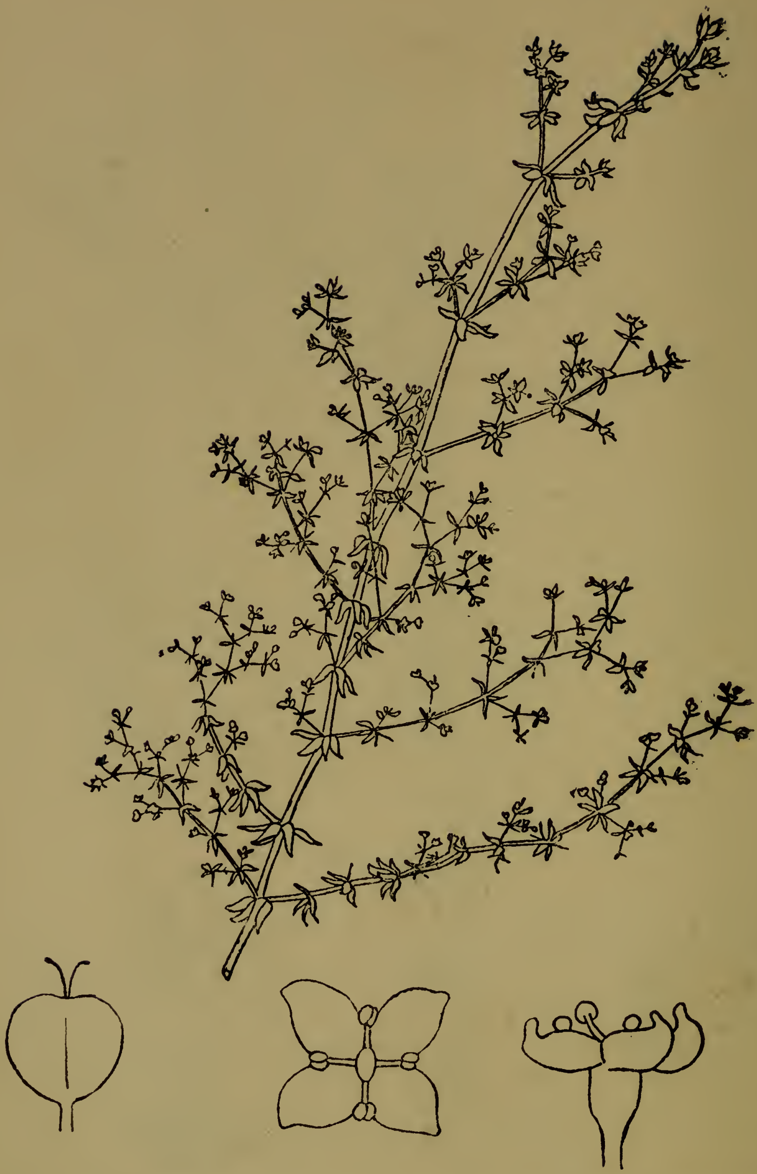
D. R. Fyson del. LASIANTHUS COFEEOIDES *Fyson.* ½ Nat.



D. R. Fyson del. SPERMACOCE OCYMOIDES *Burm.* Nat. size.



D. R. Fyson del. GALIUM ROTUNDIFOLIUM *L.* Nat. size.



D. R. Fyson del. GALIUM ASPERIFOLIUM *Wall.* Nat. size.

D. R. Fyson del. VALERIANA HOOKERIANA *W. & A.*

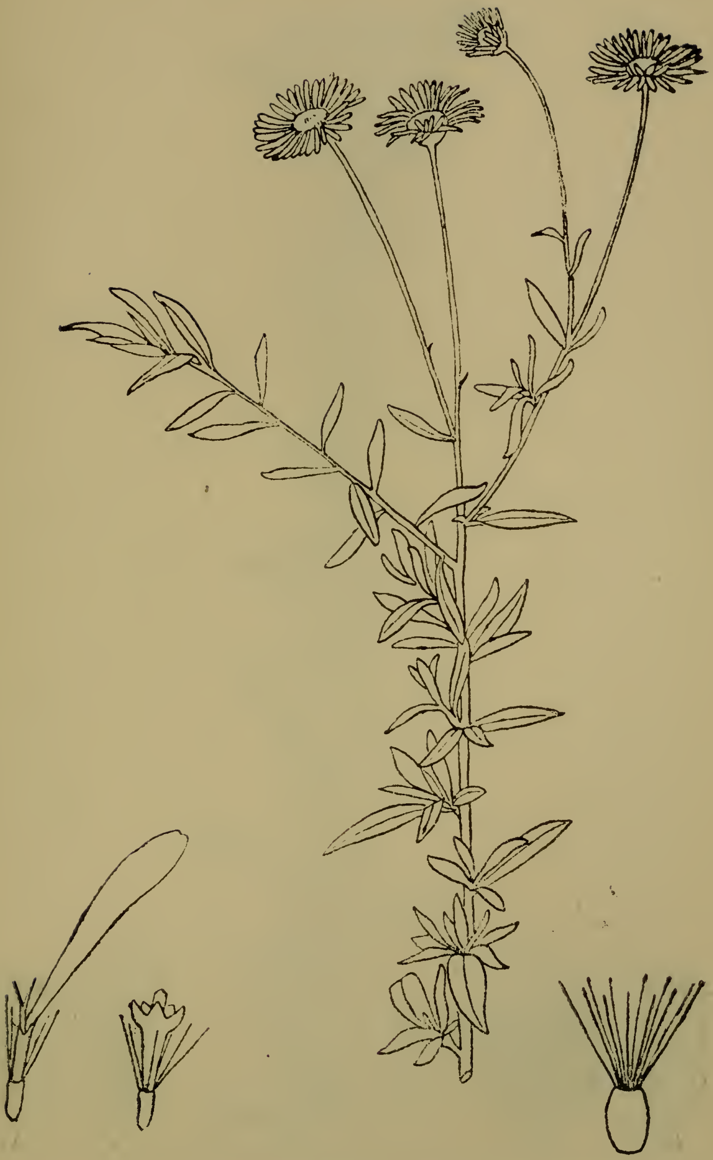
D. R. Fyson del. VERNONIA FYSONI *Calder.* ½ Nat.

D. R. Fyson del. VERNONIA PENINSULARIS *Clarke.* ½ Nat.

D. R. Fyson del. VERNONIA SALIGNA *DC.* $\frac{2}{3}$ Nat.

P. F. Fyson del. VERNONIA *Sp. Nov.* ½ Nat.

D. R. Fyson del. ERIGERON LINIFOLIUS *Willd.* ½ Nat.



D. R. Fyson del. ERIGERON MUCRONATUM *DC.* Nat. size.

D. R. Fyson del. CONYZA STRICTA *Willd.* $\frac{2}{3}$ Nat.

D. R. Fyson del. CONYZA JAPONICA *Less.* ½ Nat.

D. R. Fyson del. BLUMEA NEILGHERRENSIS *Hk. f.* ½ Nat.

D. R. Fyson del. BLUMEA HIERACIFOLIA *DC.* ½ Nat.

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D. R. Fyson del. BLUMEA HIERACIFOLIA *DC.* ⅔ Nat.

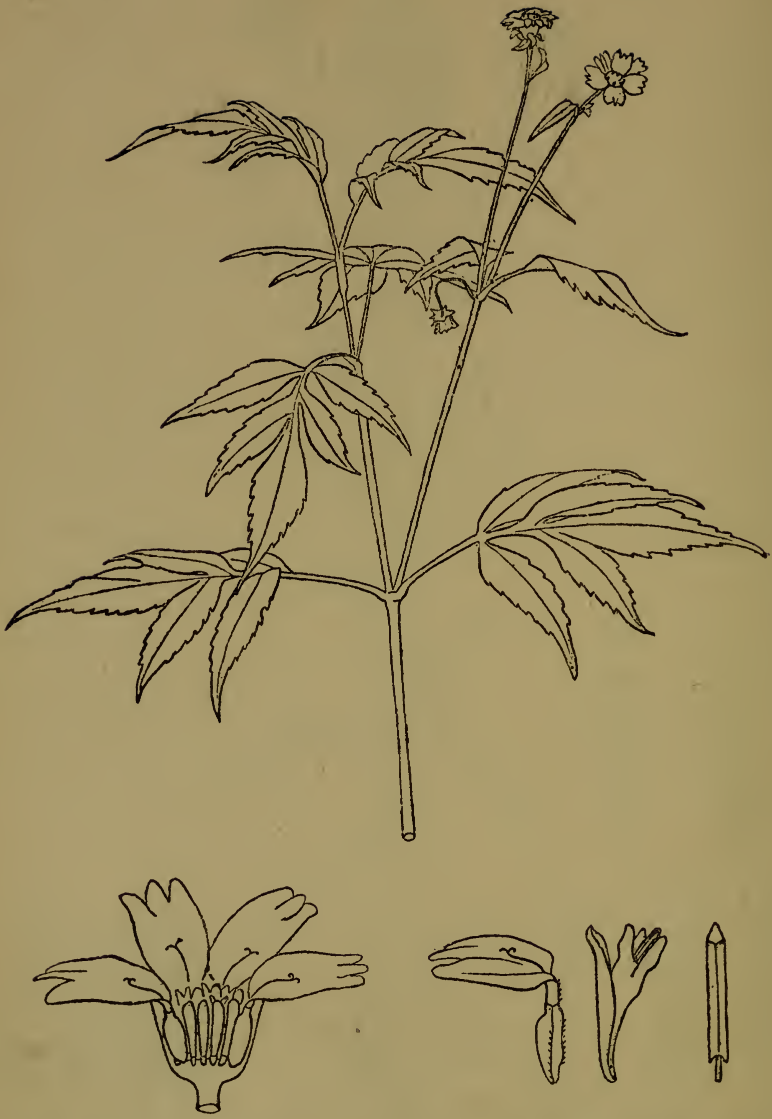
FORM I.

D. R. Fyson del. BLUMEA HIERACIFOLIA *DC.* $\frac{2}{3}$ Nat.

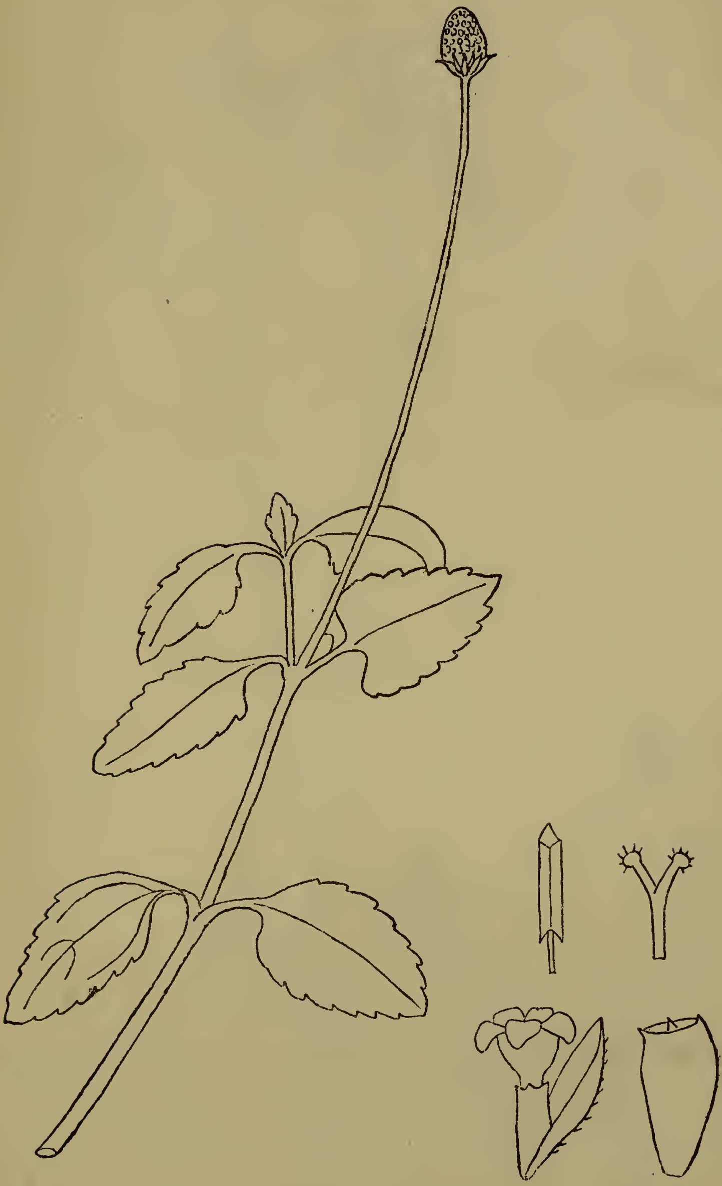
FORM 2.

D. R. Fyson del. LAGGERA ALATA *Schultz.* Nat.

D. R. Fyson del. GNAPHALIUM LUTEO-ALBUM *L.*



D. R. Fyson del. CHRYSOGONUM HETEROPHYLLUM *Benth.*
½ Nat.



D. R. Fyson del. SPILANTHES ACMELLA *L.*

D. R. Fyson del. BIDENS HUMILIS *H. B. & K.* ⅔ Nat.

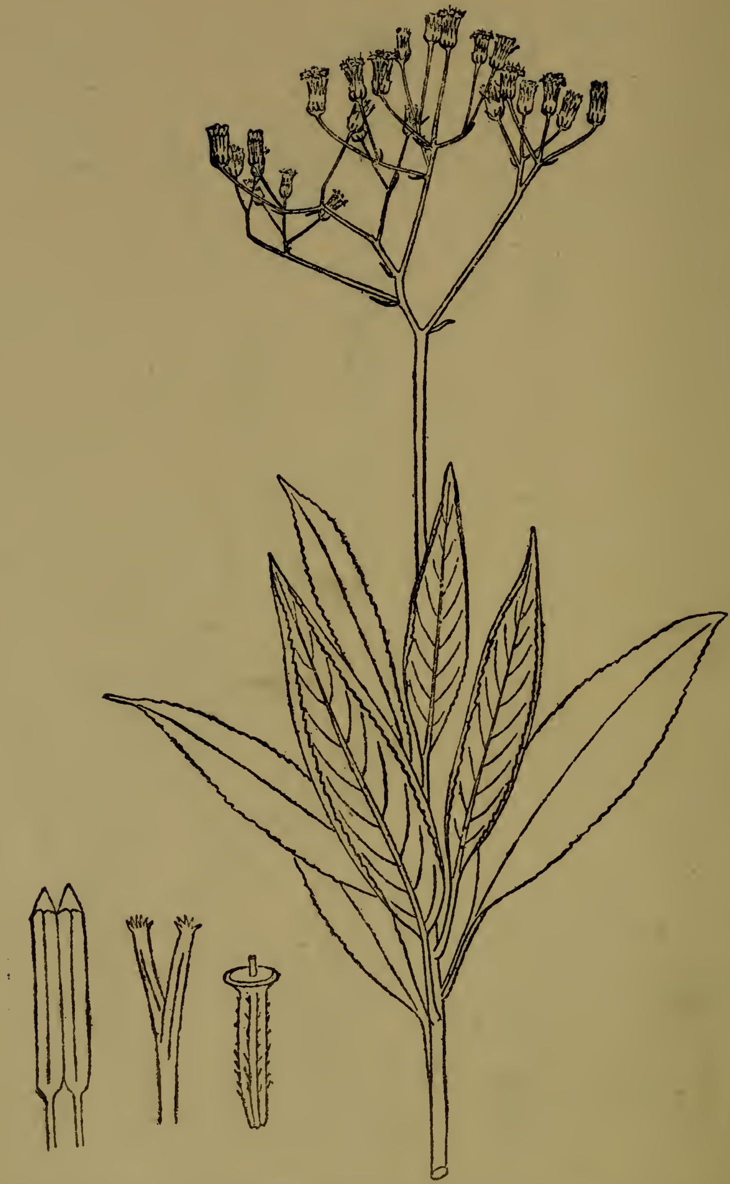
D. R. Fyson del. GALINSOGA PARVIFLORA *Cav.* Nat. size.

D. R. Fyson del. ARTEMISIA PARVIFLORA *Roxb.* ½ Nat.

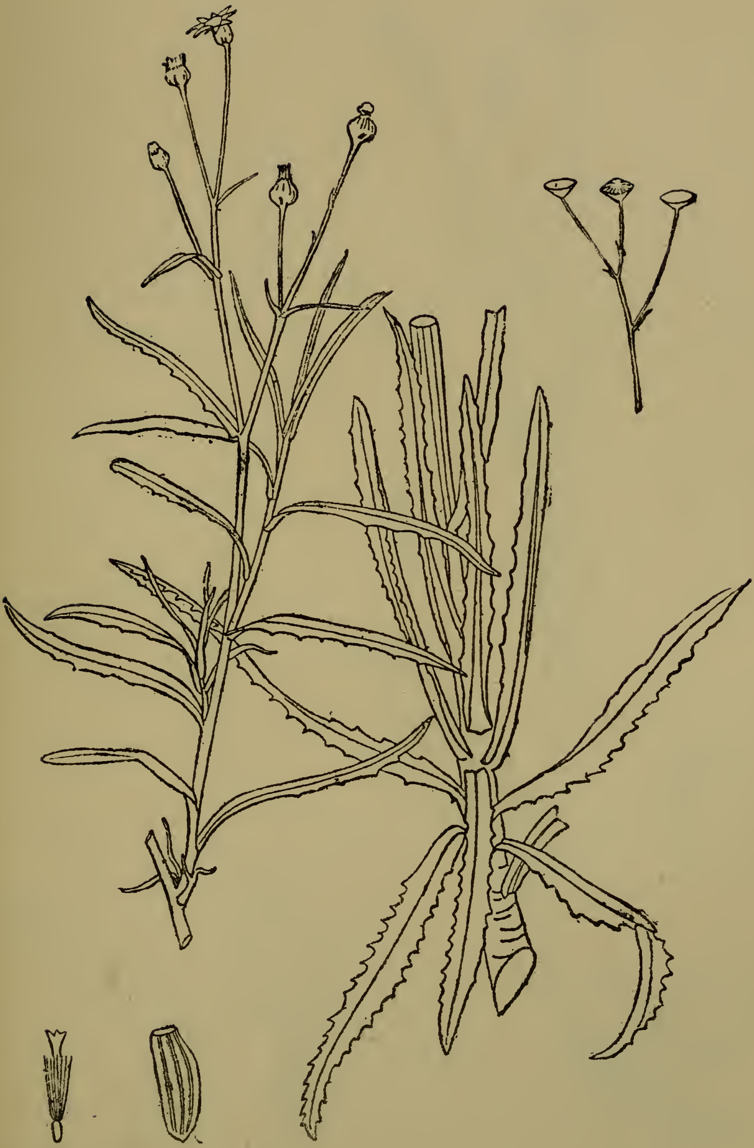
D. R. Fyson del. GYNURA NITIDA *DC.* ½ Nat.

D. R. Fyson del. EMILIA SONCHIFOLIA *Wight.* ½ Nat.

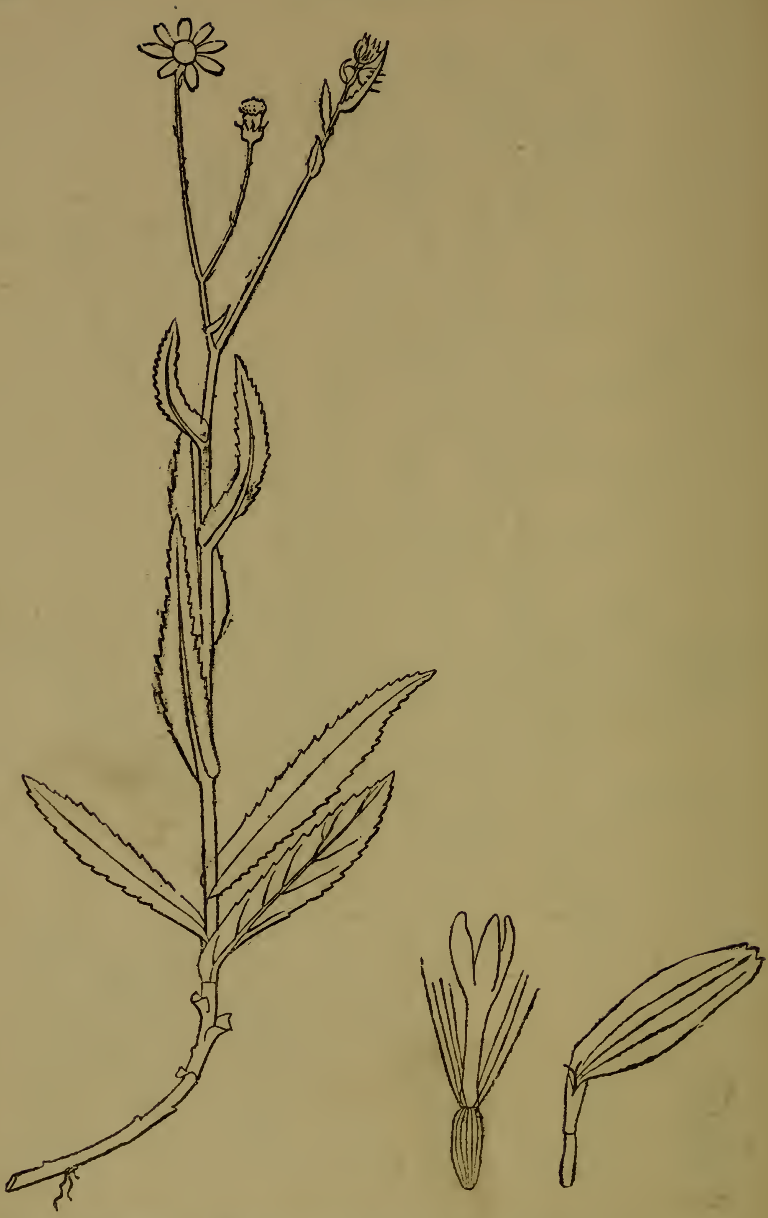
D. R. Fyson del. EMILIA ZEYLANICA *Clarke.* ½ Nat.



D. R. Fyson del. NOTONIA WALKERI *Clarke.*



D. R. Fyson del. SENECIO ZEYLANICUS *DC.*

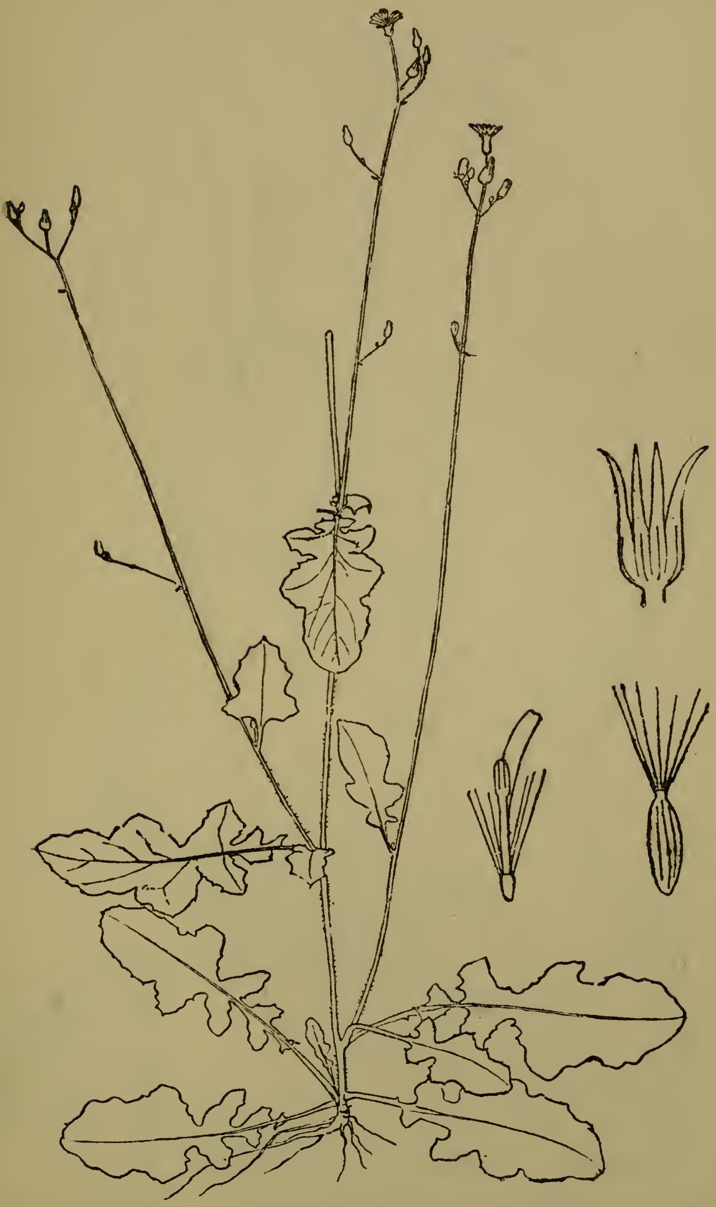


D. R. Fyson del. SENECIO SAXATILIS *Wall.*

D. R. Fyson del. SENECIO POLYCEPHALUS *Clarke.*

8

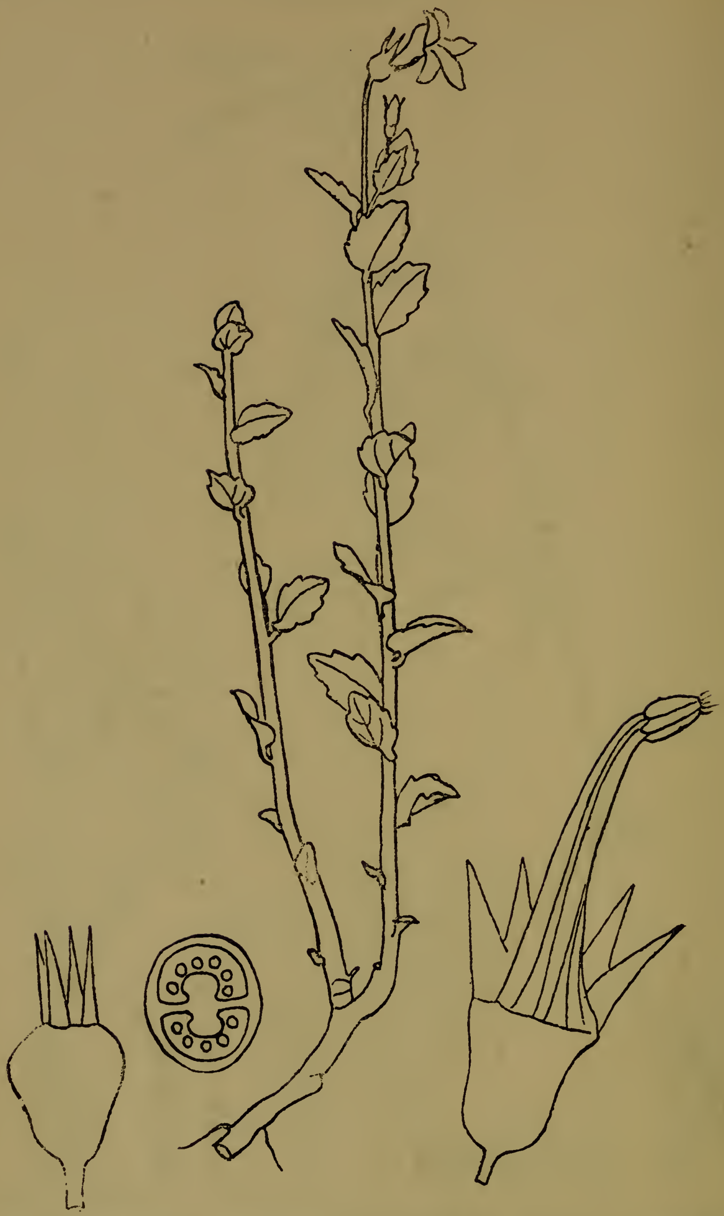
D. R. Fyson del. CNICUS WALLICHII *DC.* ½ Nat.



D. R. Fyson del. CREPIS JAPONICA *Benth.* ½ Nat.

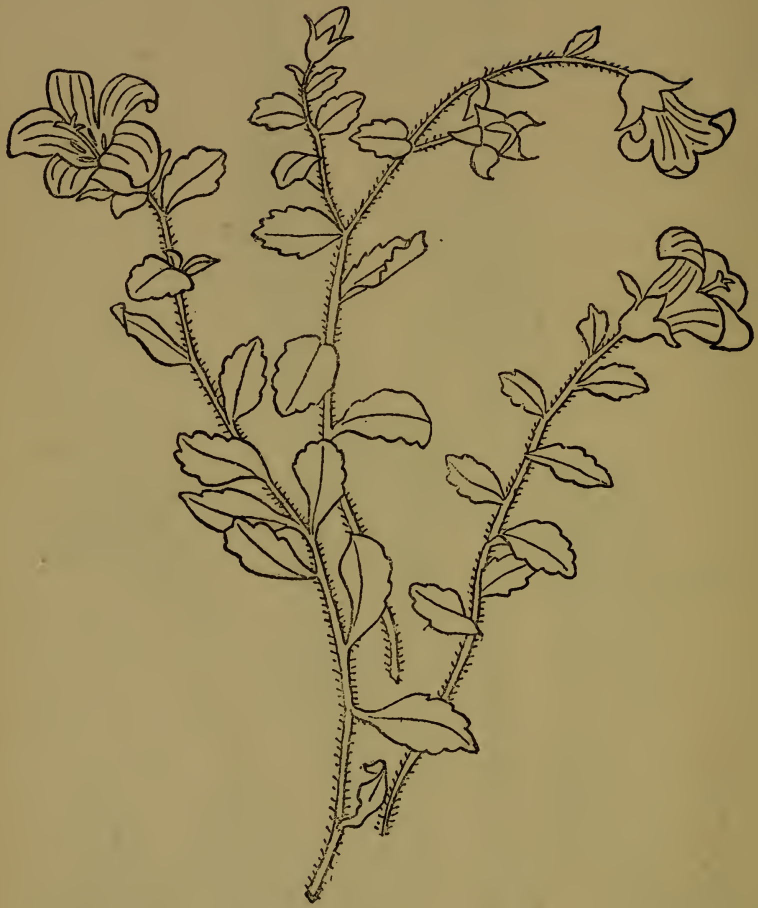
D. R. Fyson del. HYPOCHÆRIS GLABRA *L.*

D. R. Fyson del. LACTUCA HASTATA *DC.*



D. R. Fyson del. LOBELIA TRIGONA *Roxb.* Nat. size.

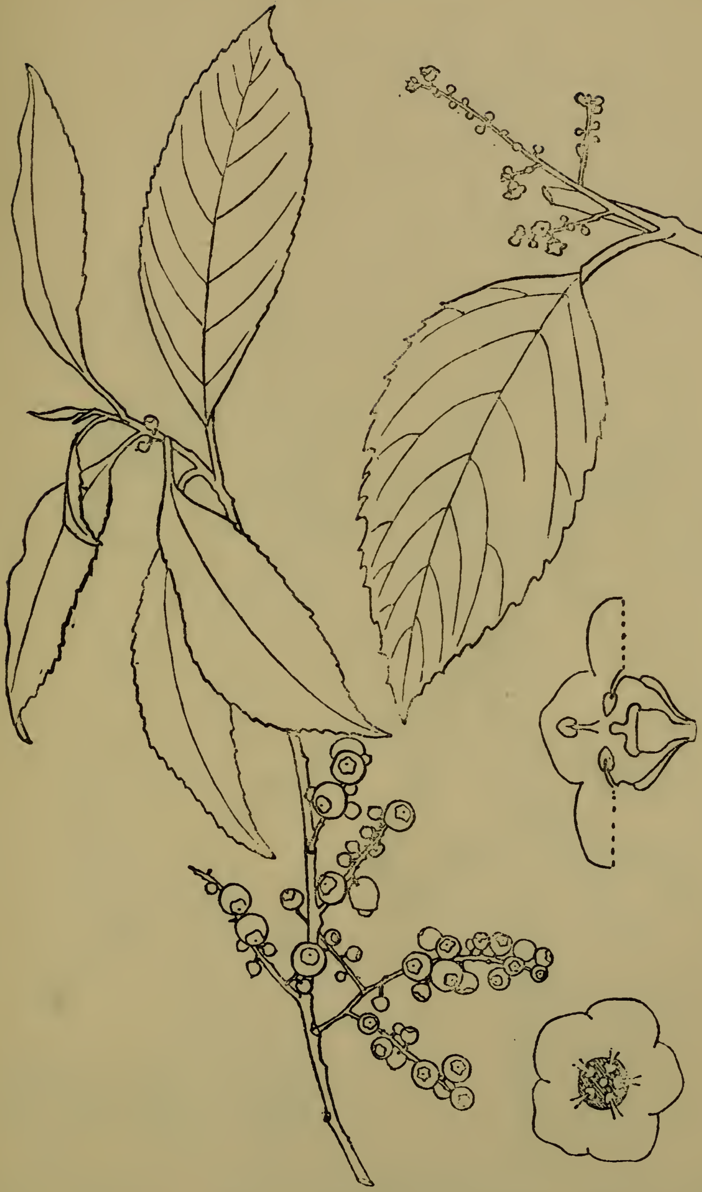
D. R. Fyson del. LOBELIA EXCELSA *Leschen.* $\frac{1}{10}$ Nat.



D. R. Fyson del. CAMPANULA ALPHONSII *Wall.*

G. B. Robertson del. VACCINIUM NILGHERRENSE *Wight*

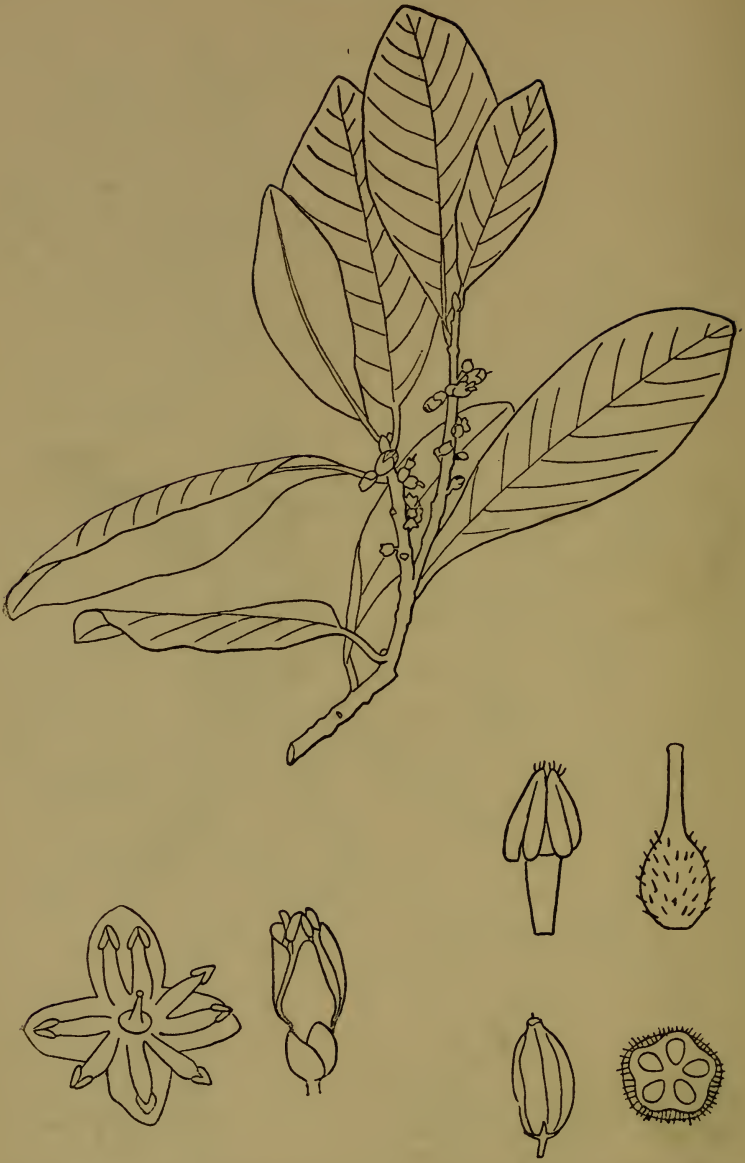
D. R. Fyson del. GAULTHERIA FRAGRANTISSIMA *Wall.* ½ Nat.



D. R. Fyson del. MÆSA PERROTTETIANA *DC.* Nat. size.

D. R. Fyson del. EMBELIA RIBES *Burm.* ½ Nat.

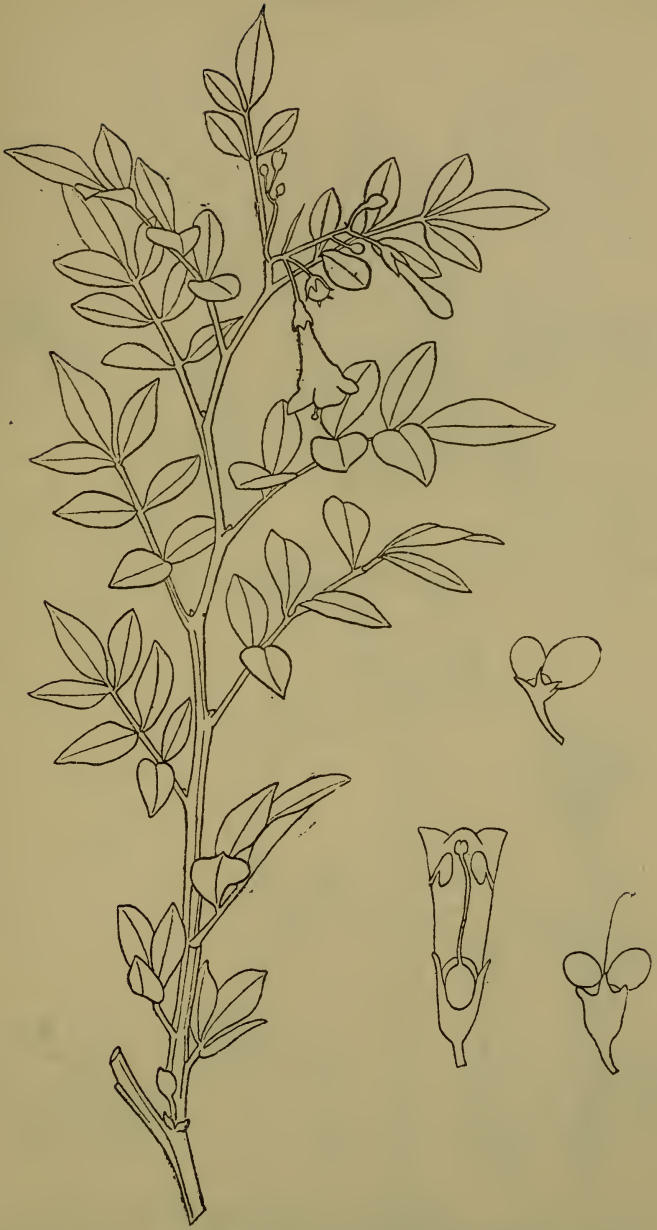
D. R. Fyson del EMBELIA VIRIDIFLORA *Schff.* ⅔ Nat.



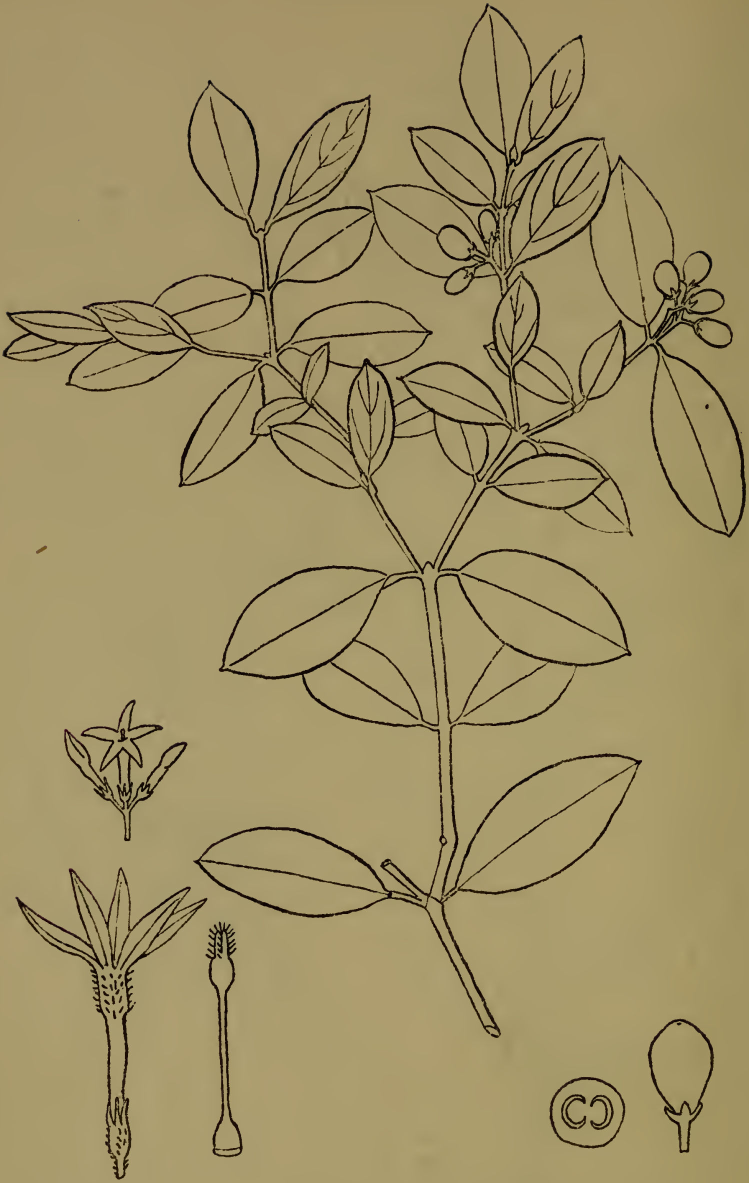
D. R. Fyson del. ISONANDRA CANDOLLEANA *Wight.* $\frac{2}{3}$ Nat

D. R. Fyson del. SYMPLOCOS SPICATA *Roxb.* ½ Nat.

D. R. Fyson del. JASMINUM SAMBAC *Ait.*



D. R. Fyson del. JASMINUM BIGNONIACEUM *Wall.*

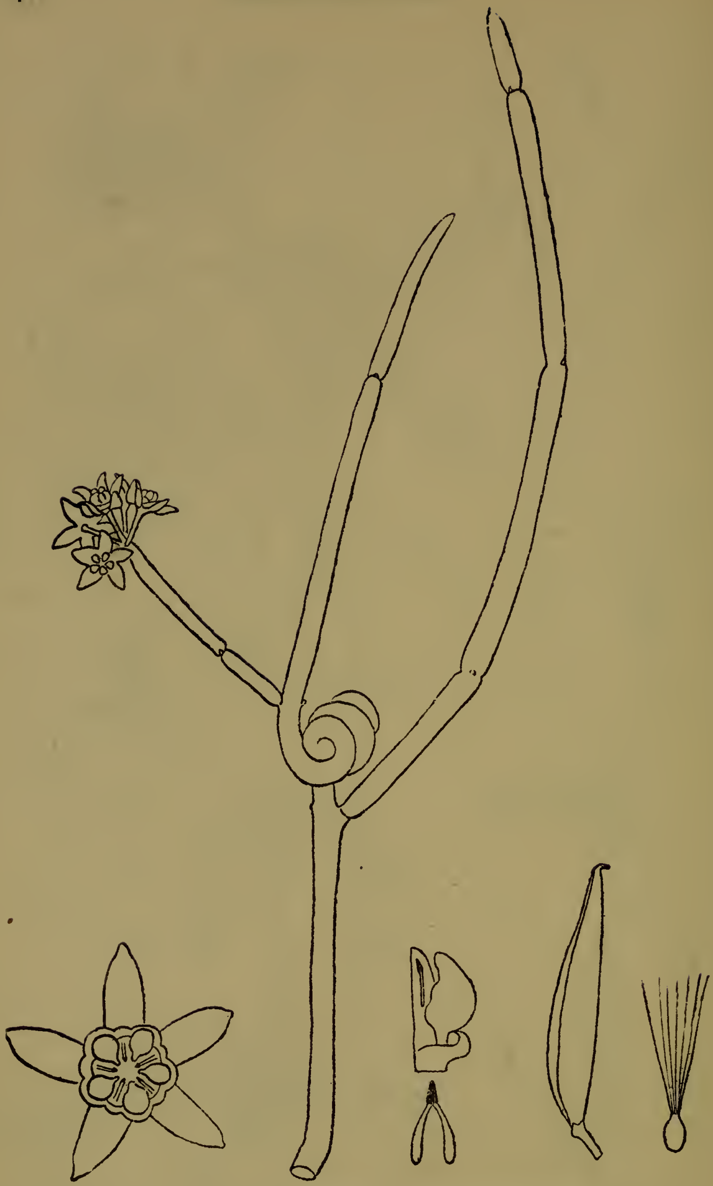


D. R. Fyson del. CARISSA PAUCINERVIA *A.DC.*

D. R. Fyson del. RAUWOLFIA DENSIFLORA *Benth.* Nat. size

D. R. Fyson del. BRACHYLEPIS NERVOSA *W. & A.* ½ Nat.

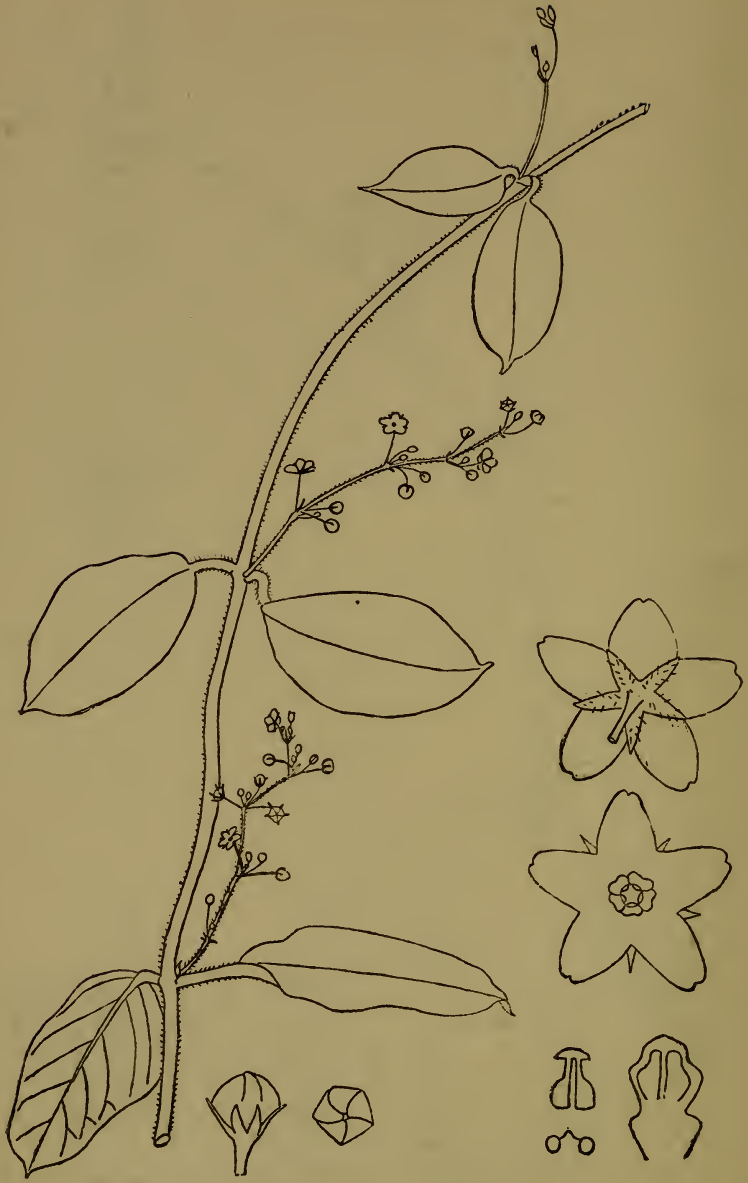
D. R. Fyson del. CYNANCHUM ALATUM *W. & A.* ½ Nat.



D. R. Fyson del. SARCOSTEMMA BREVISTIGMA *W. & A.*

$\frac{2}{3}$ Nat.

D. R. Fyson del. TYLOPHORA MOLLISSIMA *Wight*



D. R. Fyson del. TYLOPHORA TENIUS *Bl.*

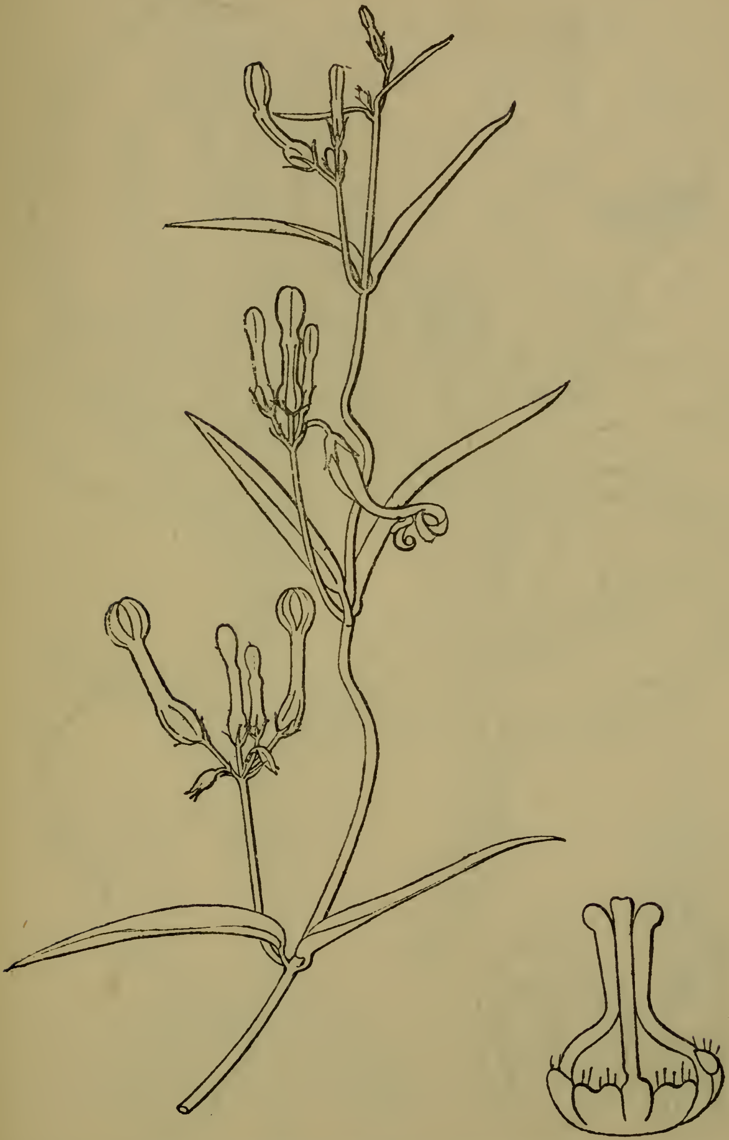
D. R. Fyson del. DREGEA VOLUBILIS *Benth.* ½ Nat.

D. R. Fyson del. HOYA OVALIFOLIA *Wight and Arn.*

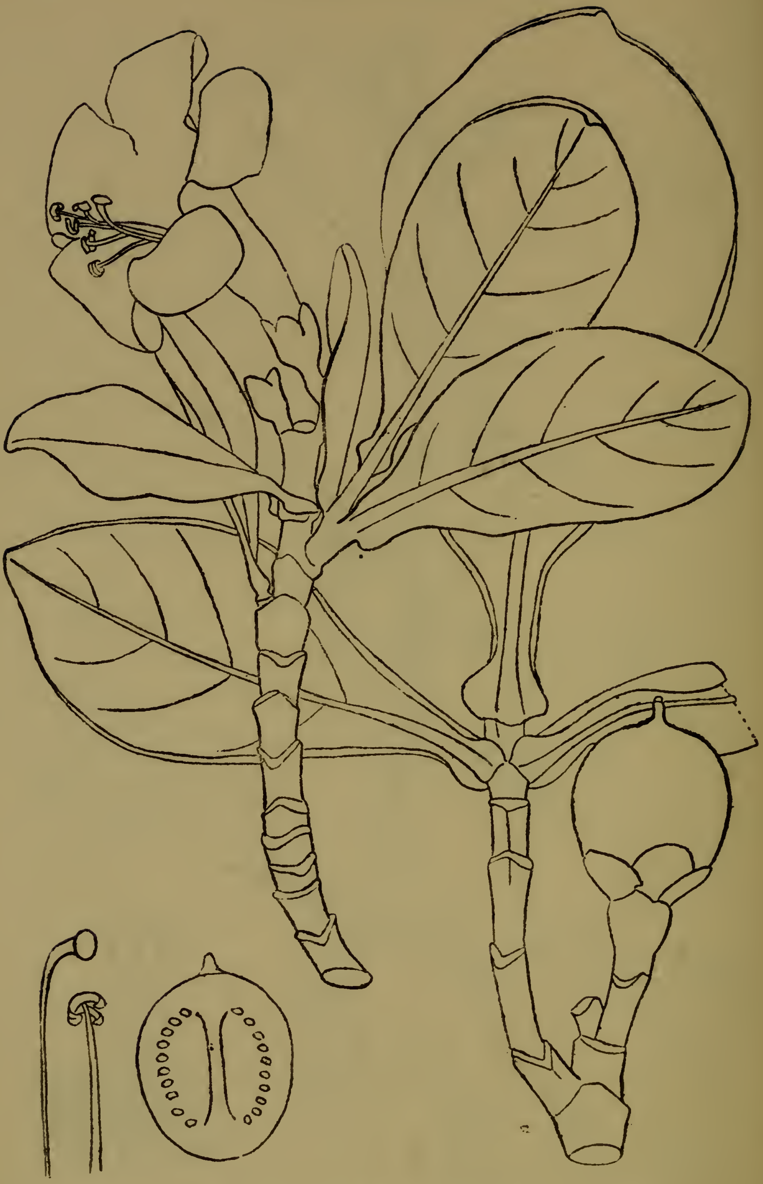
Nat. size.

D. R. Fyson del. CEROPEGIA ELEGANS *Wall.*

D. R. Fyson del. CEROPEGIA THWAITESII *Hook.*



D. R. Fyson del. CEROPEGIA CILIATA *Wt.* Nat. size.



D. R. Fyson del. FAGRÆA OBOVATA *Wall.*

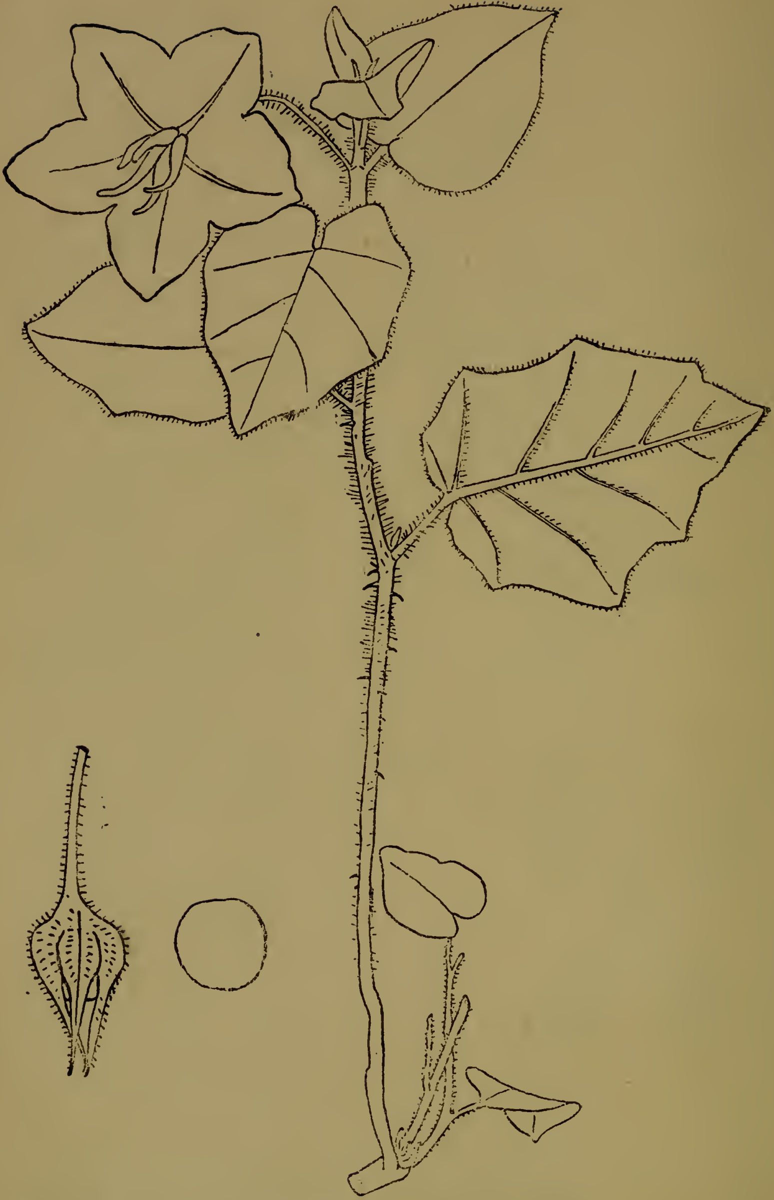
D. R. Fyson del. EXACUM ATROPURPUREUM *Bedd.* ½ Nat.

D. R. Fyson del. EXACUM WIGHTIANUM *Arn.* ½ Nat.

D. R. Fyson del. HALENIA PERROTTETII *Griseb.* ½ Nat.

D. R. Fyson del. SOLANUM Sp. *X*. VERBASCIFOLIUM *L.*

D. R. Fyson del. SOLANUM LÆVE *Dunal.* ½ Nat.



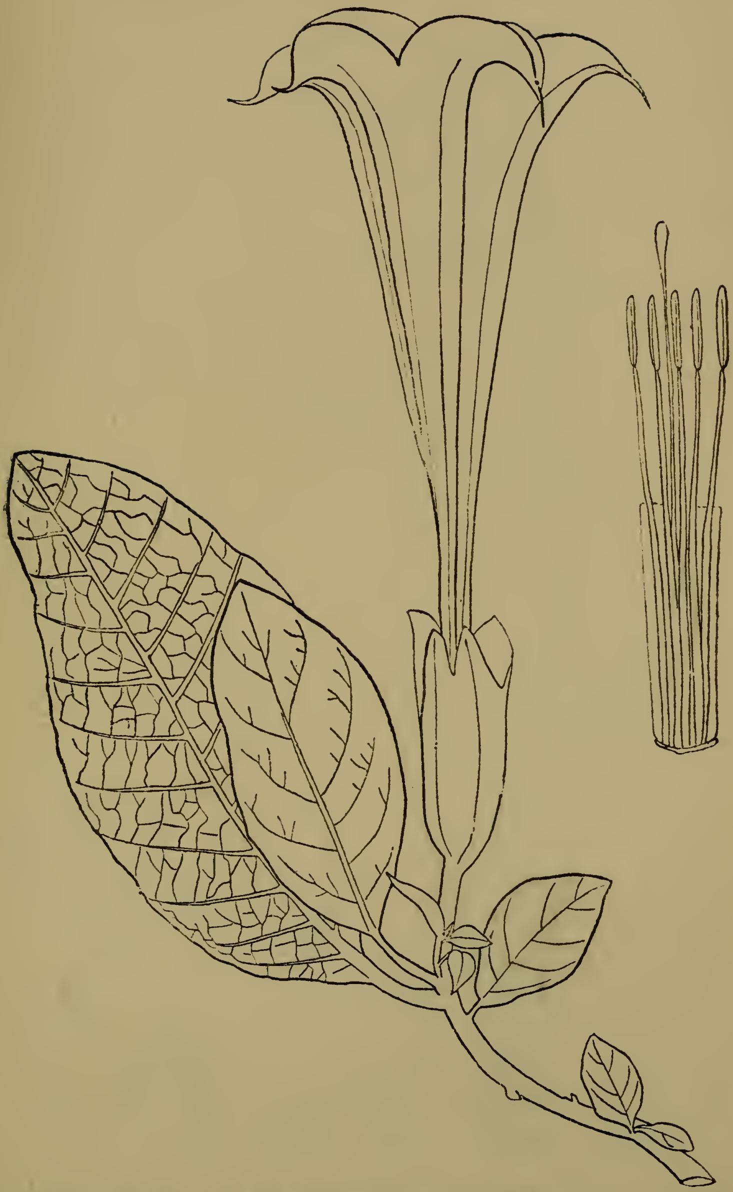
D. R. Fyson del. SOLANUM WIGHTII *Nees.*

D. R. Fyson del. SOLANUM Sp. *Z.*

D. R. Fyson del. SOLANUM SISYMBRIFOLIUM *Lamk.*

D. R. Fyson del. PHYSALIS PERUVIANA *L.*

D. R. Fyson del. NICANDRA PHYSALOIDES *Gærtn.*



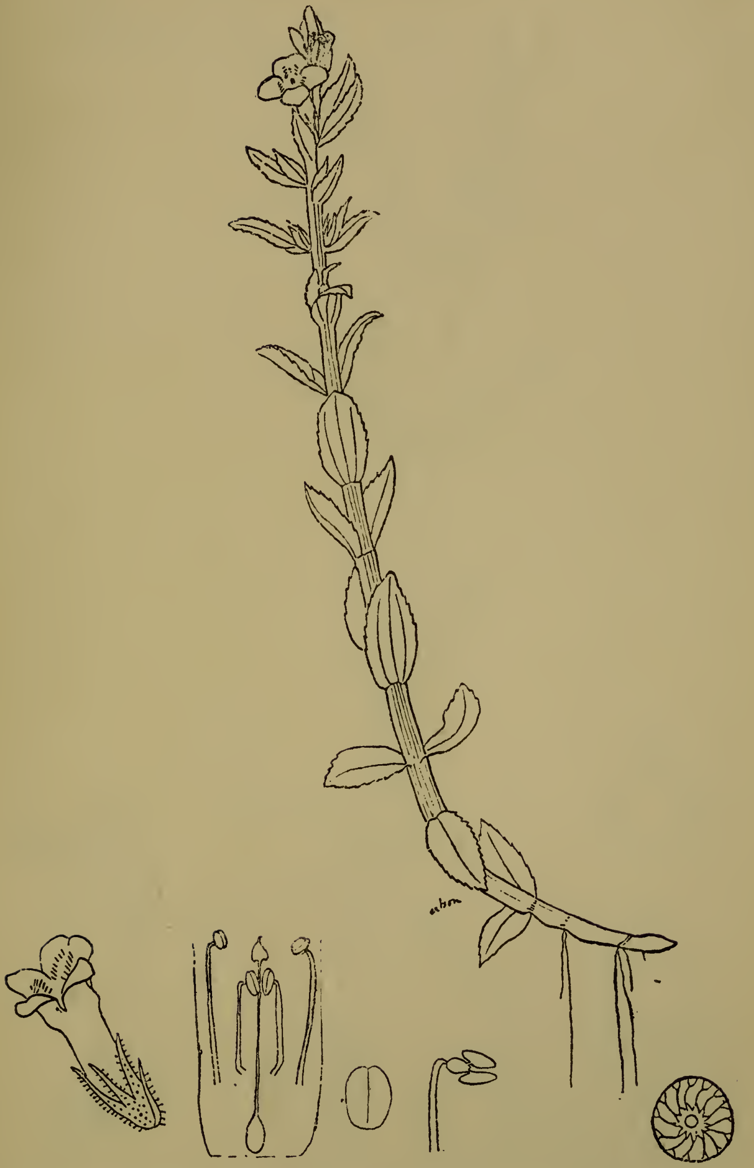
D. R. Fyson del. DATURA STRAMONIUM *L.*

Mrs. E. W. Stoney del. VERBASCUM THAPSUS *L.*

D. R. Fyson del. CALCEOLARIA MEXICANA *Benth.*

TORENIA ASIATICA *L.*

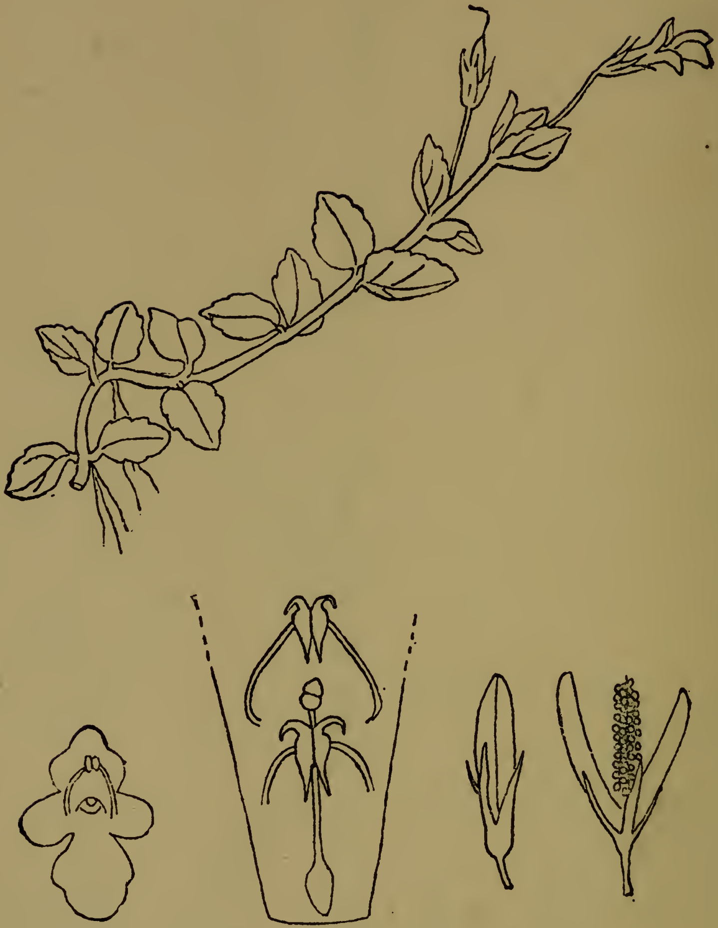
D. R. Fyson del.



G. B. Robertson del. LIMNOPHILA HYPERICIFOLIA *Benth.*
and D. R. Fyson del.

D. R. Fyson del. LIMNOPHILA GRATIOLOIDES *Br.* Nat. size.

D. R. Fyson del. ILLYSANTHES HYSSOPIOIDES *Benth.*
Nat. size.



D. R. Fyson del. BONNAYA VERONICÆFOLIA *Spr.* Nat. size.

D. R. Fyson del. STRIGA LUTEA *Lour.* Nat. size.

D. R. Fyson del. CHRISTISONIA TUBULOSA *Benth.* Nat. size.

D. R. Fyson del. CHRISTISONIA BICOLOR *Gardn.*

D. R. Fyson del. KLUGIA NOTONIANA *DC.*

D. R. Fyson del. STROBILANTHES FOLIOSUS *T. Andres.*

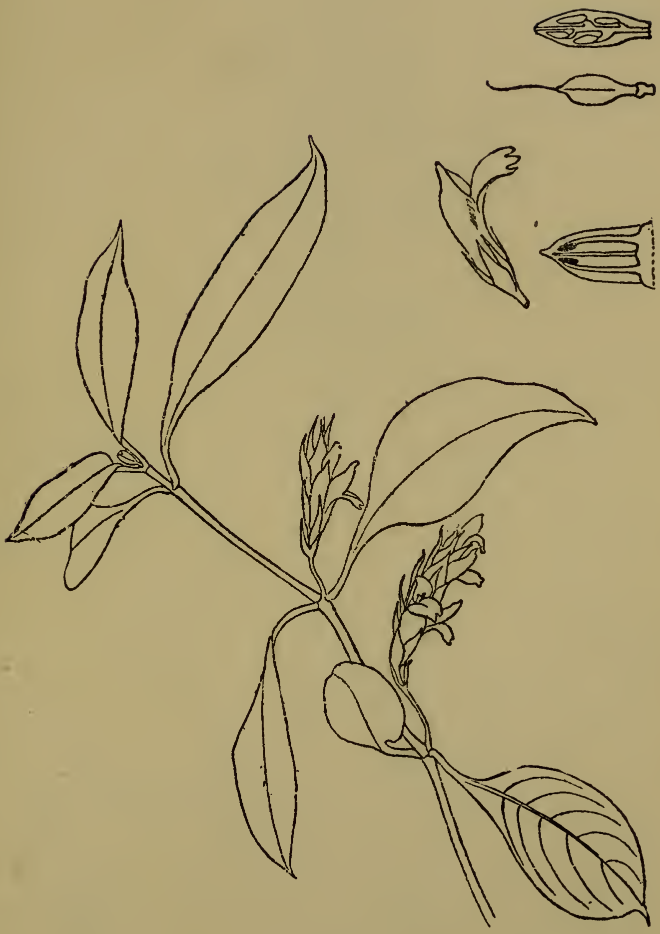
D. R. Fyson del. STROBILANTHES PULNEYENSIS *Clarke.*

D. R. Fyson del. STROBILANTHES LURIDUS *Wight.*
⅔ Nat.

D. R. Fyson del. BARLERIA INVOLUCRATA *Nees.* Nat.

D. R. Fyson del. ASYSTASIA CRISPATA *Benth.* ⅔ Nat.

D. R. Fyson del. ANDROGRAPHIS LINEATA *Nees.* ½ Nat.

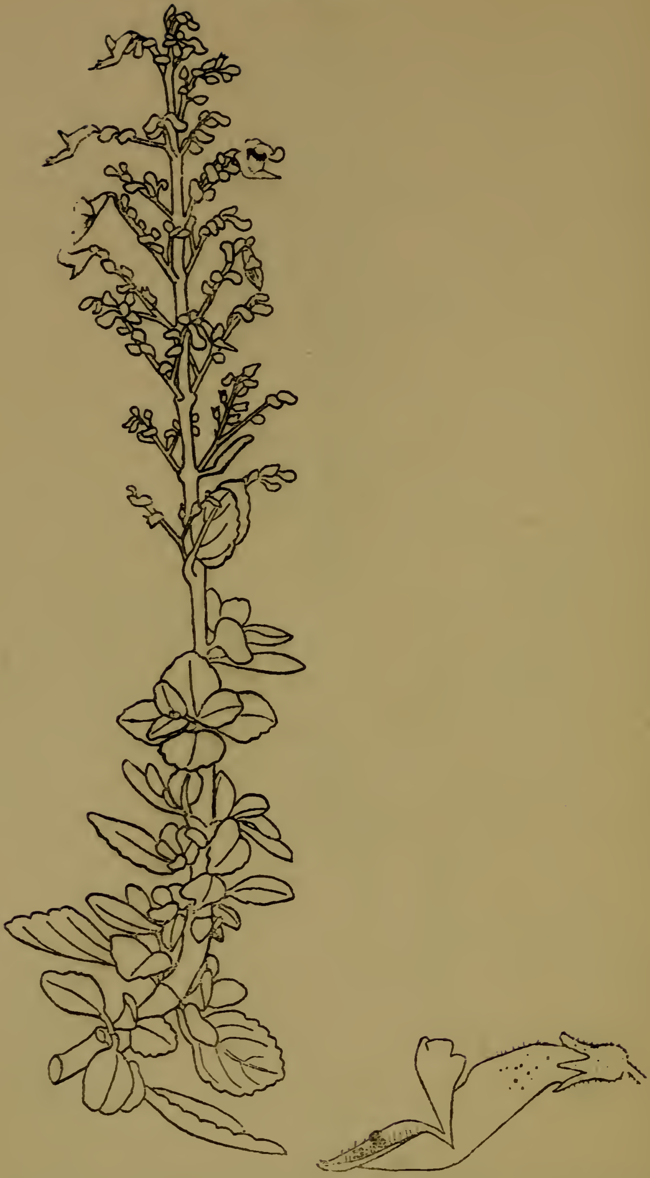


D. R. Fyson del. RUNGIA LÆTA *Clarke.* ½ Nat.

D. R. Fyson del. CLERODENDRON SERRATUM *Spreng.*
½ Nat.

D. R. Fyson del. PLECTRANTHUS WIGHTII *Benth.*

⅔ Nat.



D. R. Fyson del. PLECTRANTHUS NILGHIRICUS *Benth.*
½ Nat.

D. R. Fyson del. PLECTRANTHUS MACRÆI *Benth.*

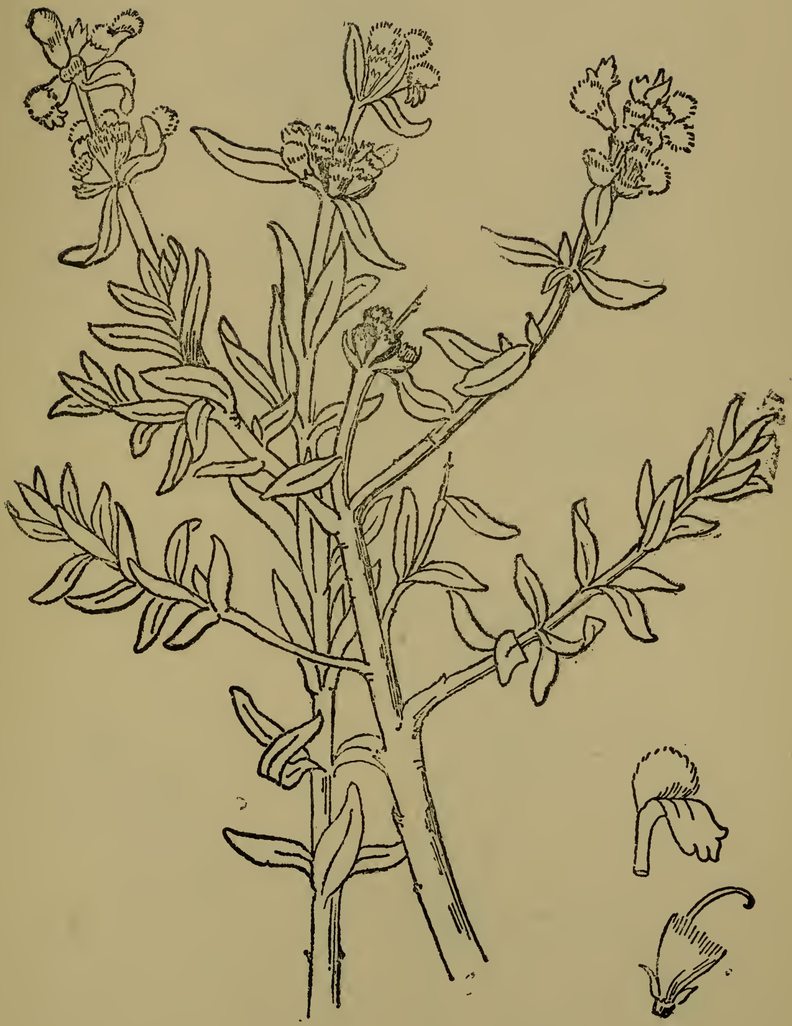
D. R. Fyson del. PLECTRANTHUS URTICIFOLIUS Hk. f.

D. R. Fyson del. POGOSTEMON MOLLIS *Benth.* ½ Nat.

G. Robertson del. DYSOPHYLLA AURICULARIA *Bl.*

D. R. Fyson del. CALAMINTHA UMBROSA *Benth.*

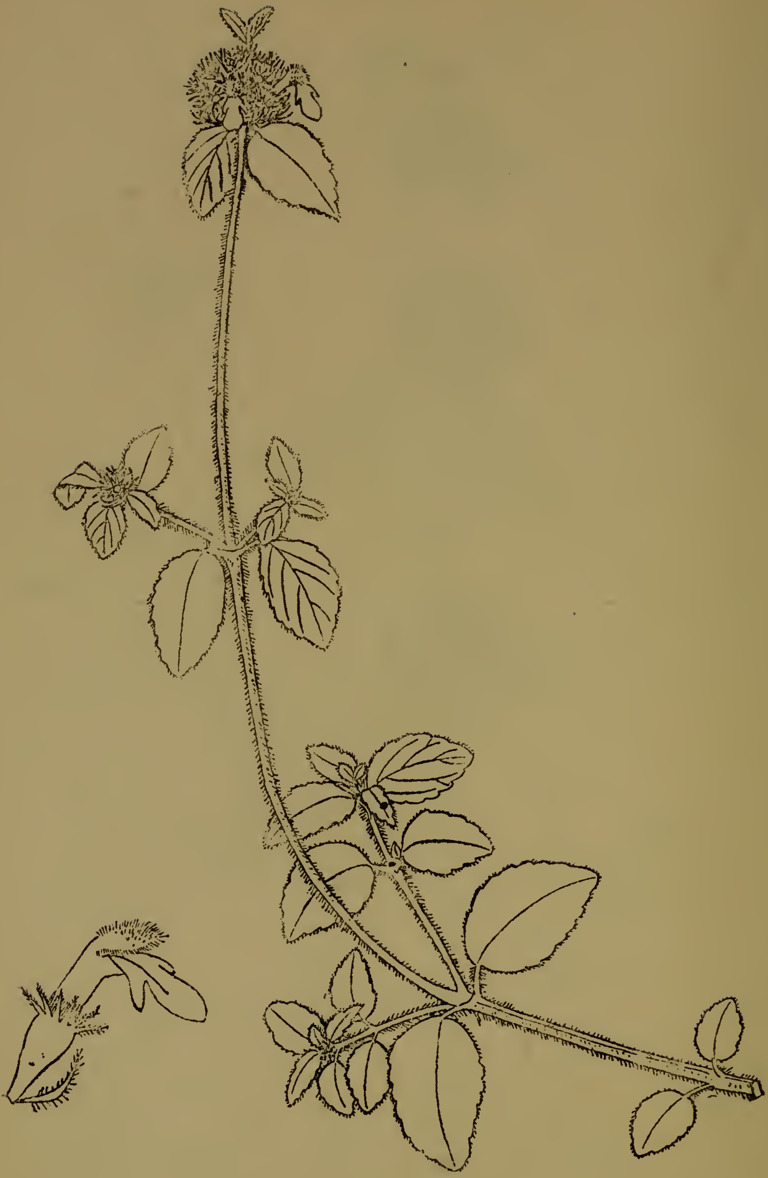
D. R. Fyson del. LEUCAS MARRUBIOIDES *Desf.*



M. F. Harrison del. LEUCAS HELIANTHEMIFOLIA *Desf.*

D. R. Fyson del. LEUCAS LAMIIFOLIA *Desf.*

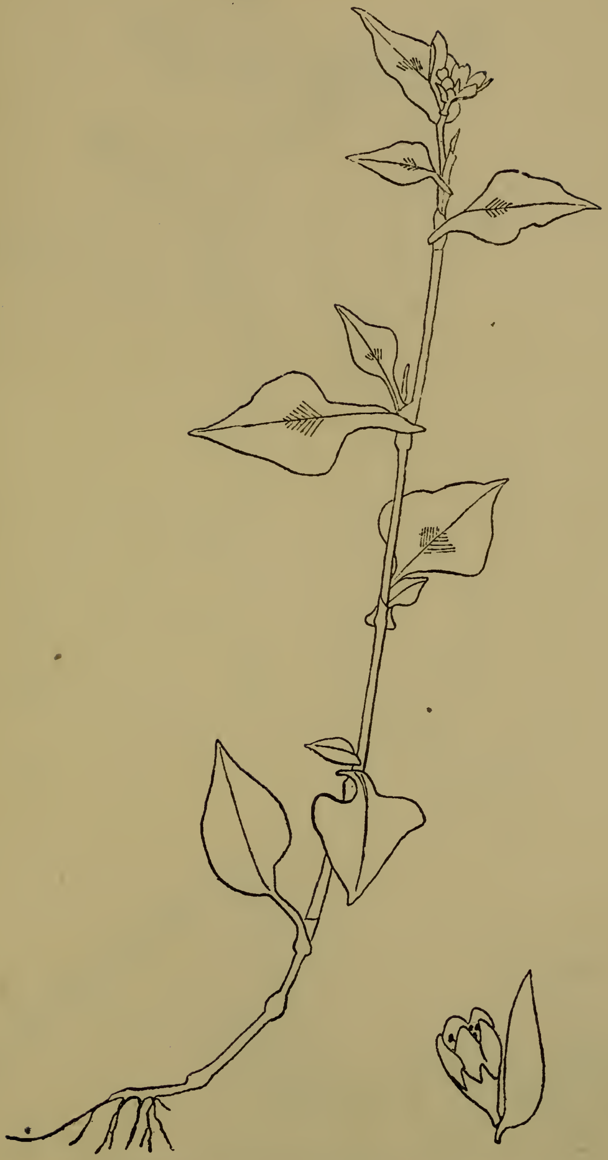
D. R. Fyson del. LEUCAS VESTITA *Benth.*



D. R. Fyson del. LEUCAS HIRTA *Spreng.*

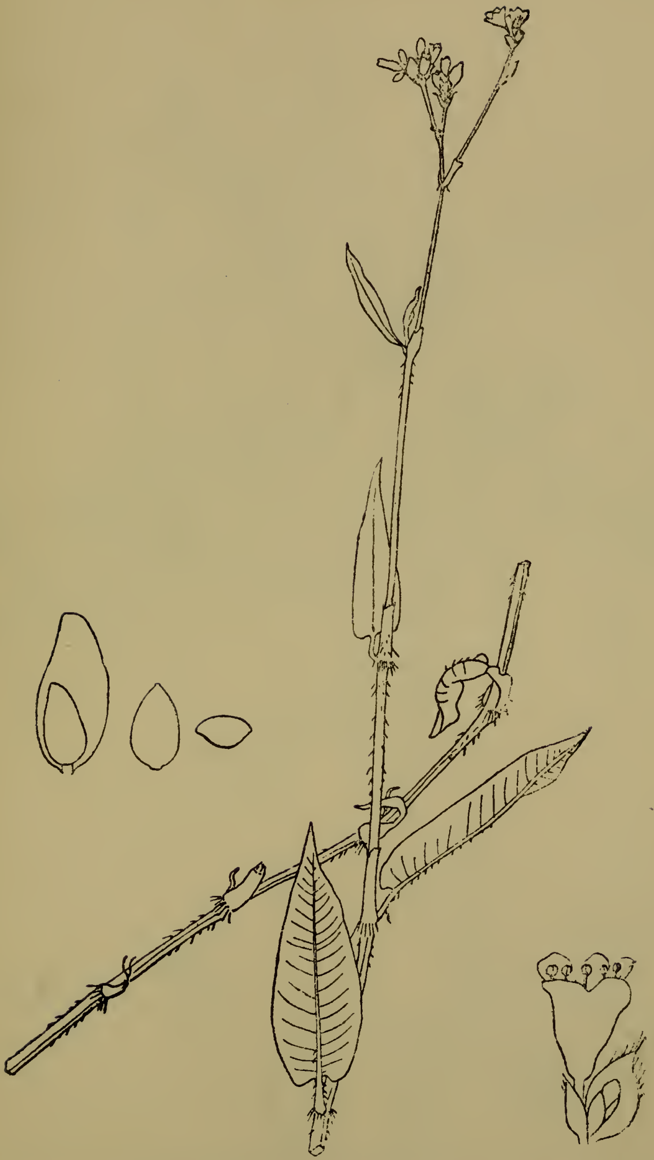
D. R. Fyson del. LEUCAS LINIFOLIA *Spr.*

D. R. Fyson del. ACHYRANTHES BIDENTATA *Bl.*



D. R. Fyson del. POLYGONUM ALATUM *Ham.*

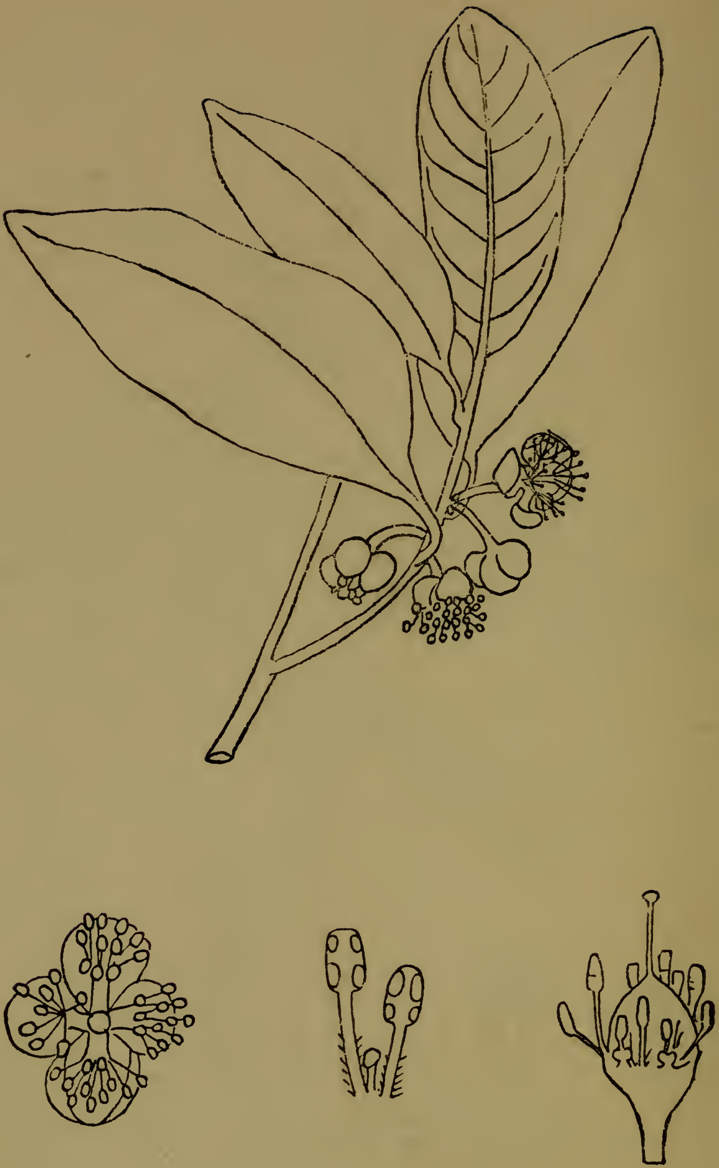
D. R. Fyson del. POLYGONUM CHINENSE *L.*



D. R. Fyson del. POLYGONUM STRIGOSUM *Br.*

D. R. Fyson del. CINNAMOMUM WIGHTII *Meissn.*

D. R. Fyson del. LITSÆA WIGHTIANA *Wall.*



D. R. Fyson del. LITSÆA LIGUSTRINA *Nees.*

D. R. Fyson del. NEOLITSÆA ZEYLANICA *Merril.*

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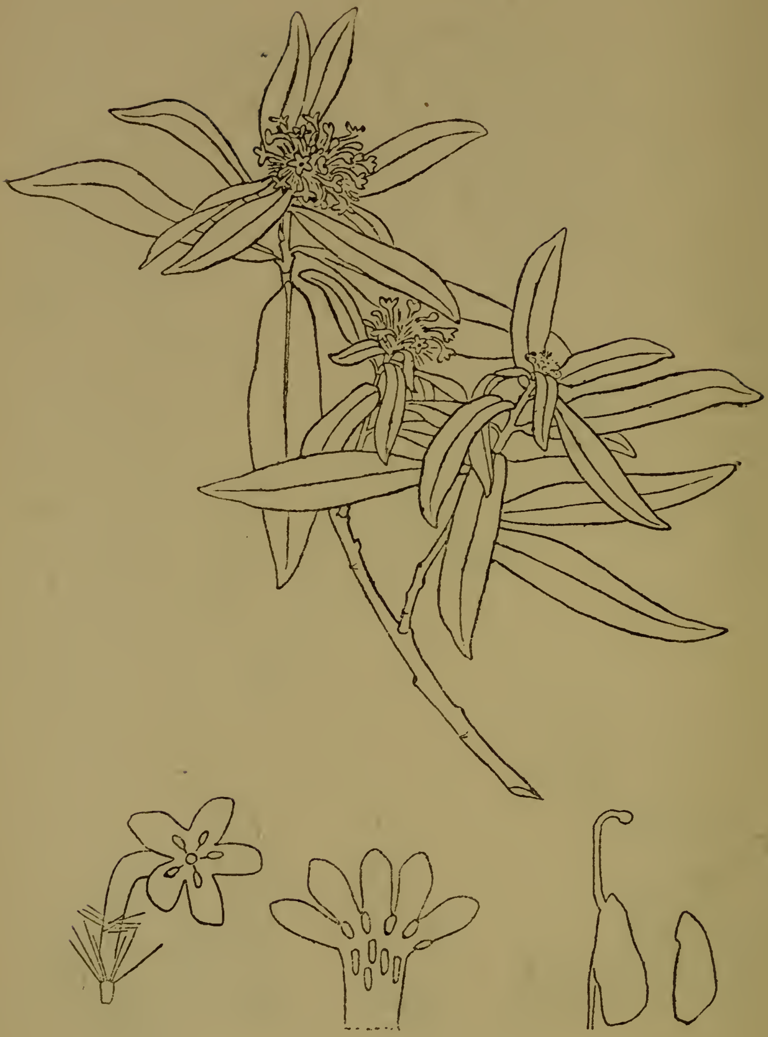


D. R. Fyson del LASIOSIPHON ERIOCEPHALUS *Decaisne.*

D. R. Fyson del LORANTHUS OBTUSATUS *Wall.*

D. R. Fyson del. LORANTHUS TOMENTOSUS *Heyne.*

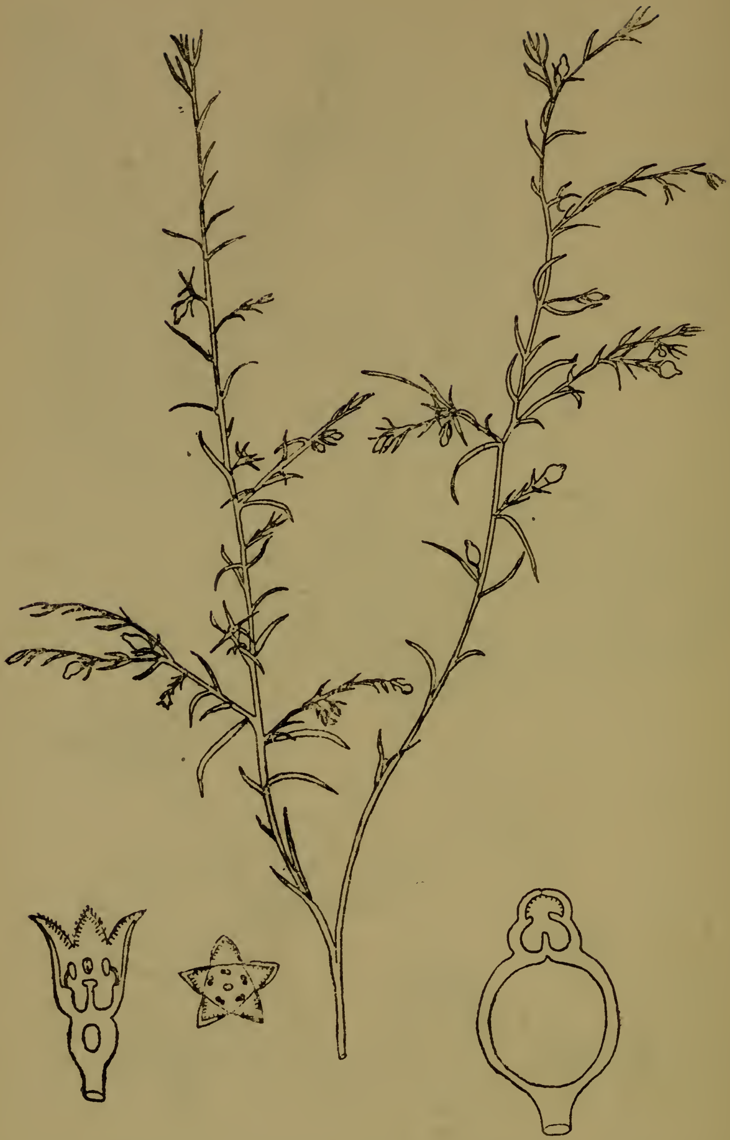
D. R. Fyson del. LORANTHUS RECURVUS *Wall.*

D. R. Fyson del. LORANTHUS MEMECYLIFOLIUS *W. & A.*

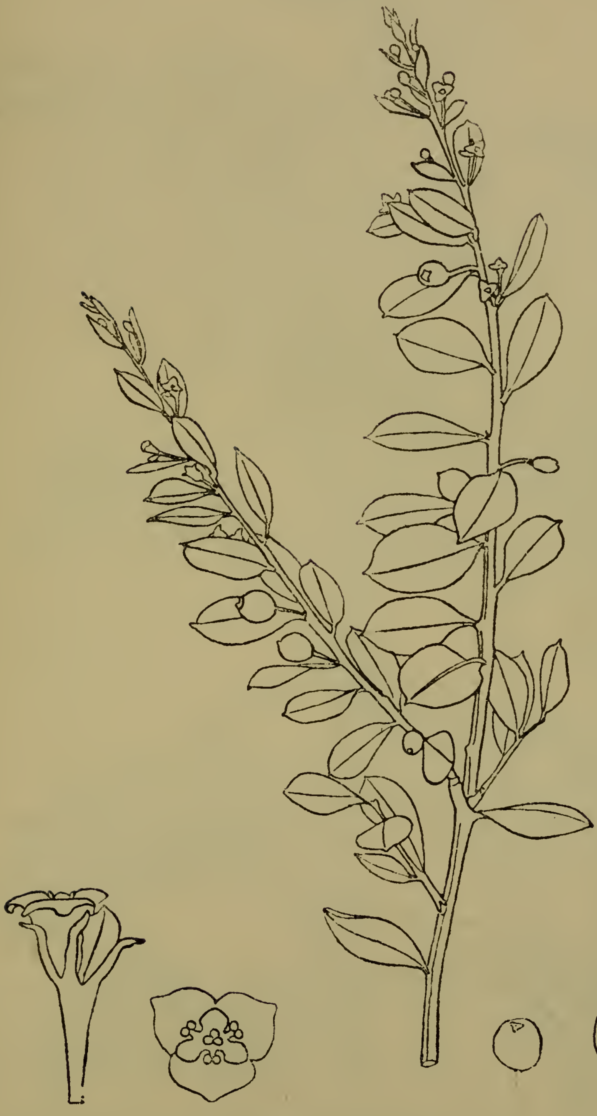
D. R. Fyson del. LORANTHUS CAPITELLATUS *W. & A.*

D. R. Fyson del. KORTHALSELLA JAPONICA *Van Tiegh*
Thunb.

G. B. Robertson del. VISCUM ORBICULATUM *Wight.*

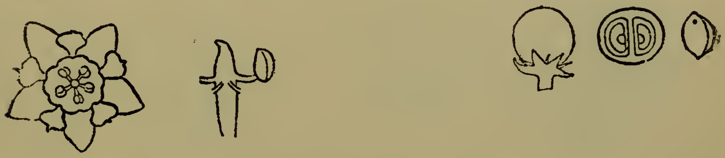


D. R. Fyson del. THESIUM WIGHTIANUM *Wall.*



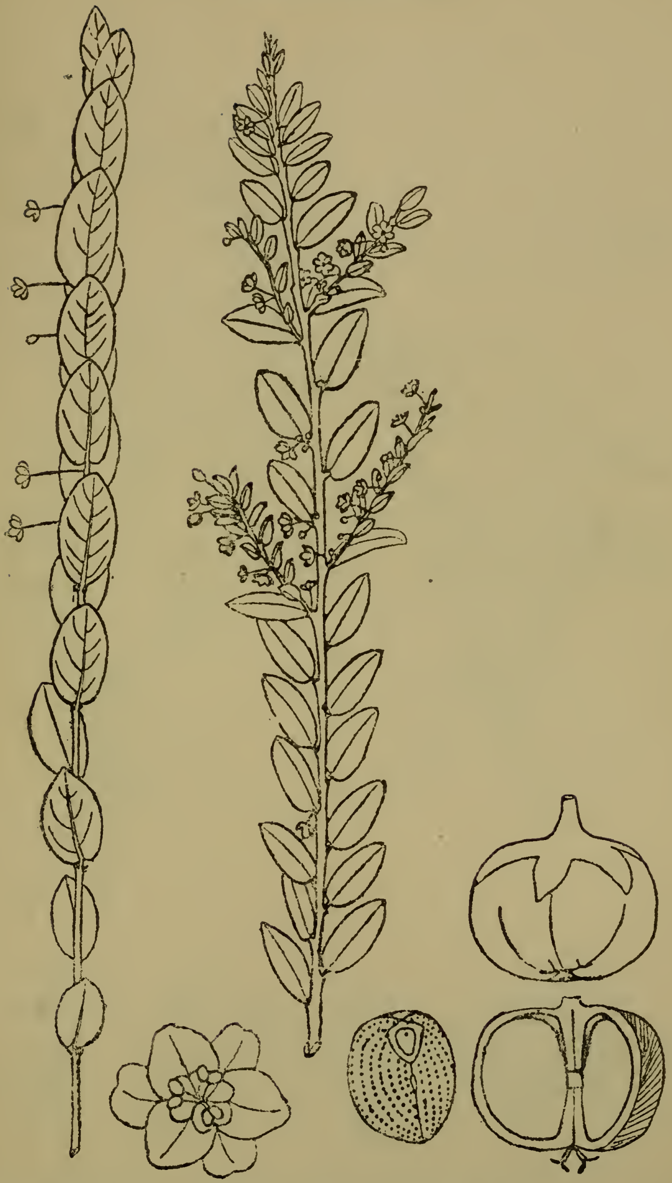
D. R. Fyson del. OSYRIS ARBOREA *Wall.*

D. R. Fyson del. EUPHORBIA OREOPHILA *Miq.*

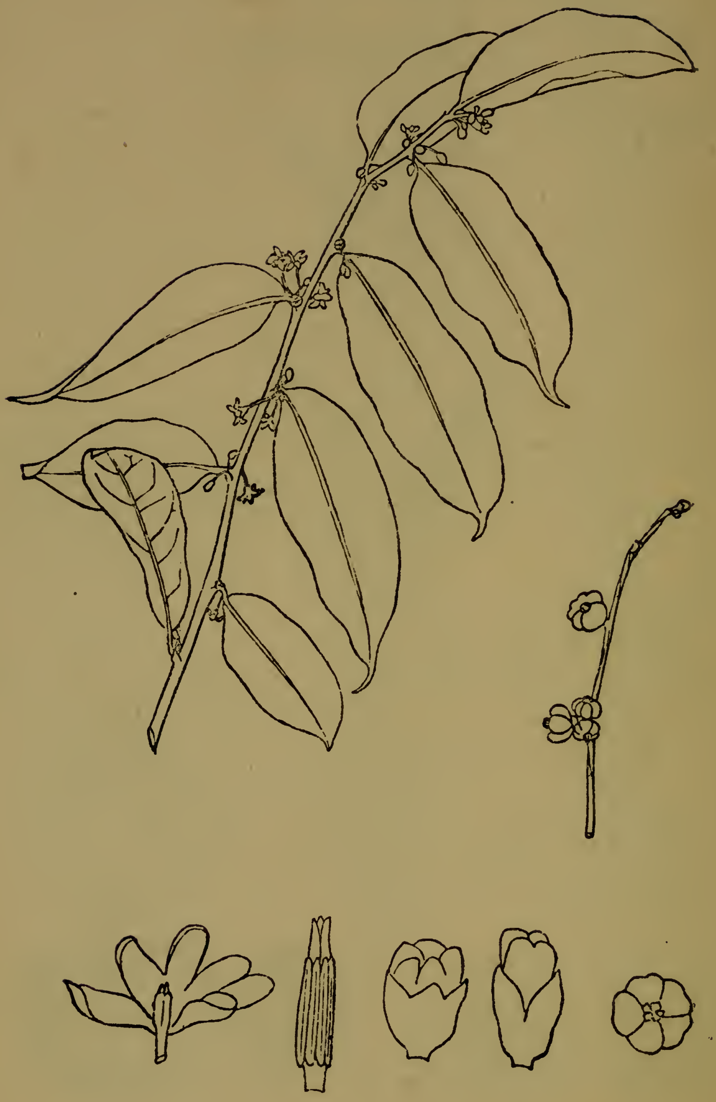


BRIDELIA RETUSA *Spreng.*

D. R. Fyson del. PHYLLANTHUS RHEEDII *Wight.*



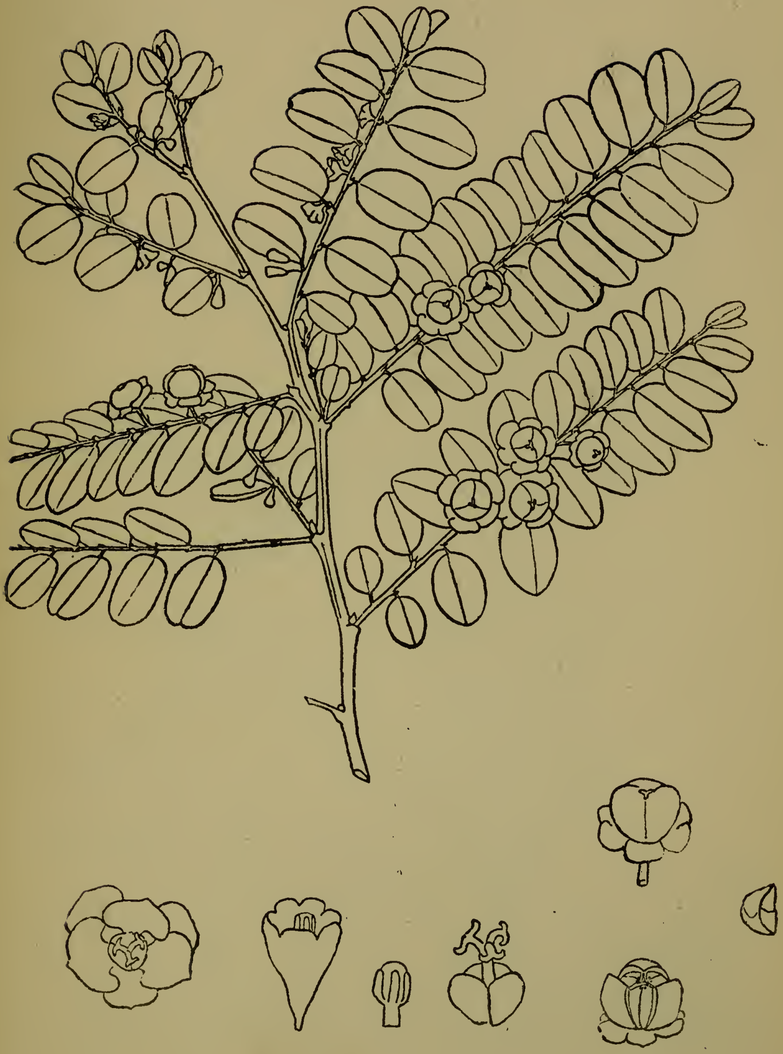
D. R. Fyson del. PHYLLANTHUS SIMPLEX *Retz.*



D. R. Fyson del. GLOCHIDION NEILGHERRENSE *Wt.*

D. R. Fyson del. GLOCHIDION NEILGHERRENSE *Wt.*
(Abnormal male flowers.)

D. R. Fyson del. GLOCHIDION VELUTINUM *Wt.*



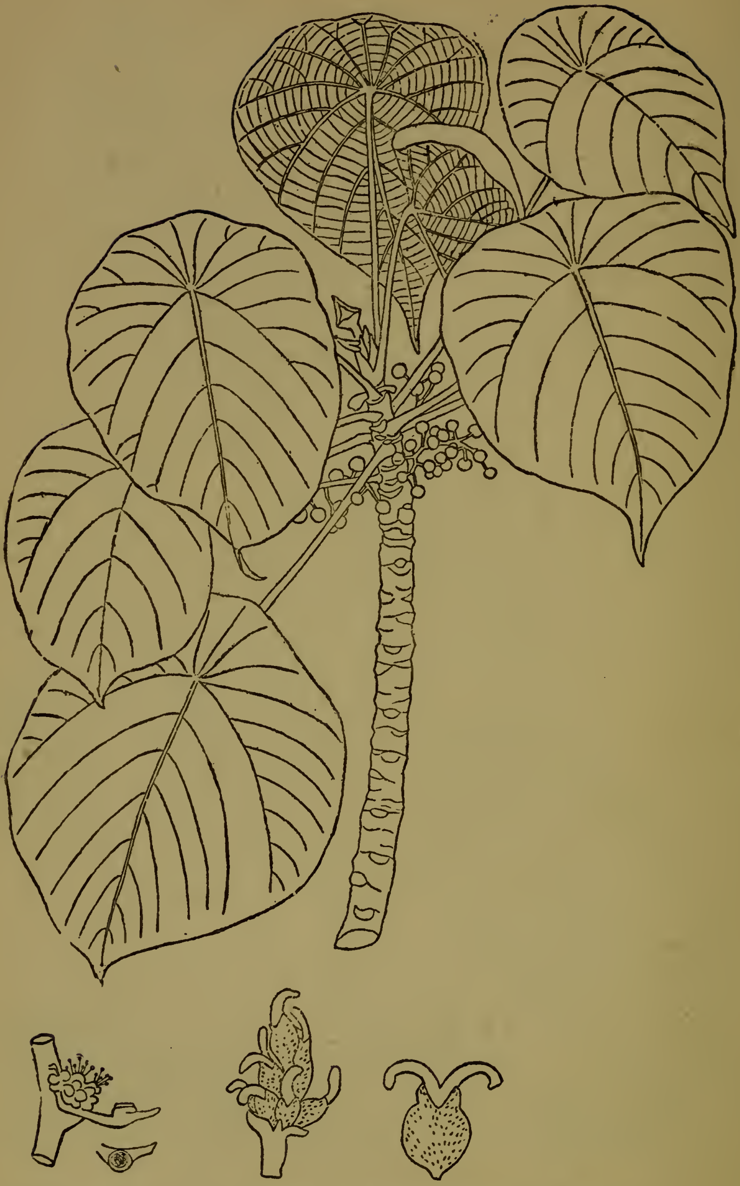
D. R. Fyson del. BREYNIA PATENS *Benth.*

D. R. Fyson del. DAPHNIPHYLLUM GLAUCESCENS *Bl.*

D. R. Fyson del. ANTIDESMA MENASU *Miq.*

D. R. Fyson del. CROTON AROMATICUS *L.*

D. R. Fyson del. MALLOTUS PHILIPPINENSIS *Muell.*



D. R. Fyson del.

MACARANGA INDICA *Wight.*

D. R. Fyson del. CELTIS WIGHTII *Planch.*

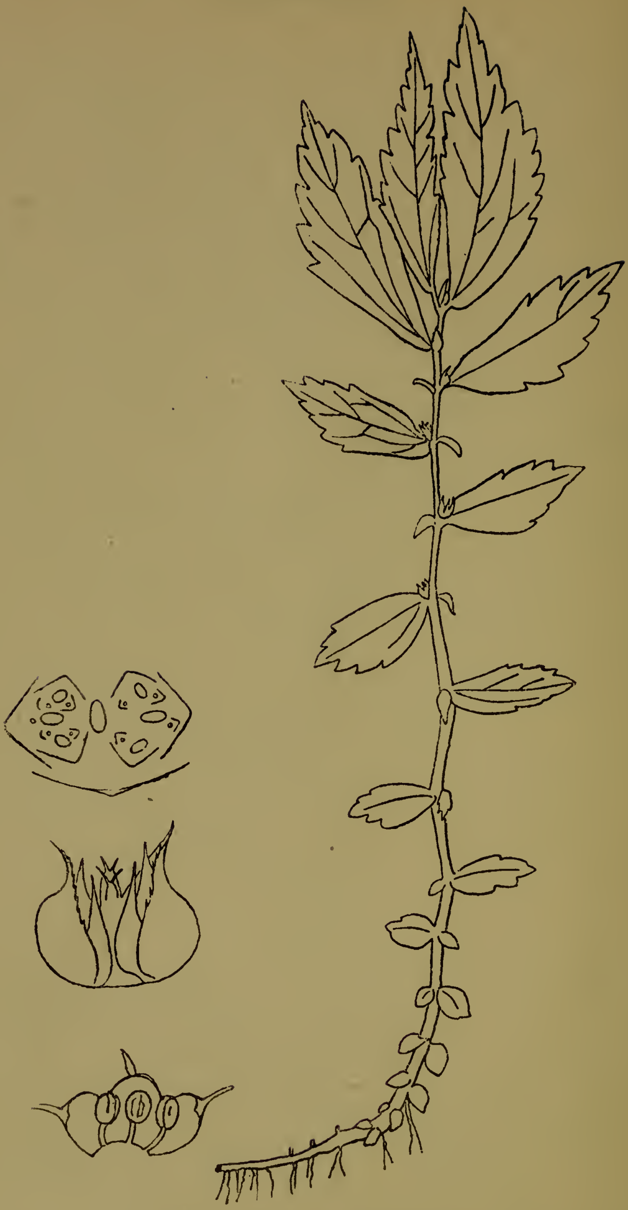
TREMA ORIENTALIS *Bl.*

D. R. Fyson del.

D. R. Fyson del. DROSTENIA INDICA *Wall.*

D. R. Fyson del. PILEA TRINERVIA *Wight.*

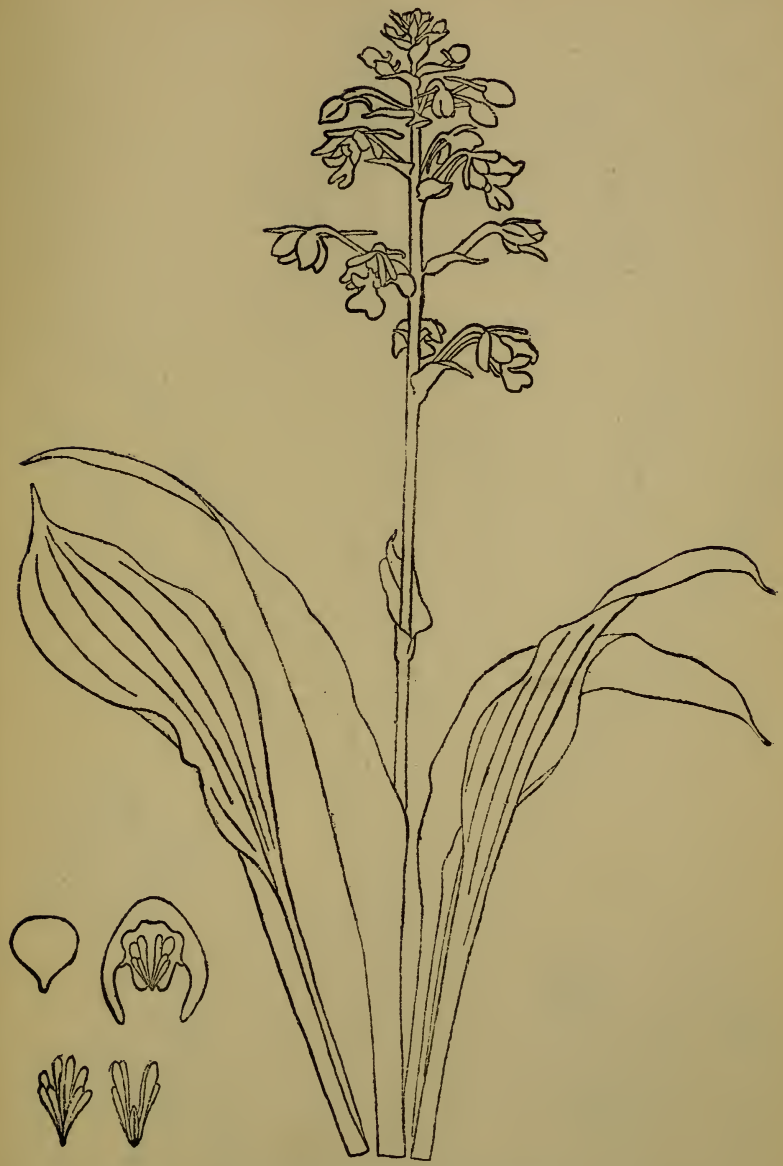
D. R. Fyson del. ELATOSTEMA LINEOLATUM *Wight.*



D. R. Fyson del. ELATOSTEMA SURCULOSUM *Wight.*

D. R. Fyson del. POUZOLZIA WIGHTII *Benn.*

D. R Fyson del. MICROSTYLIS RHEEDII *Wt.*



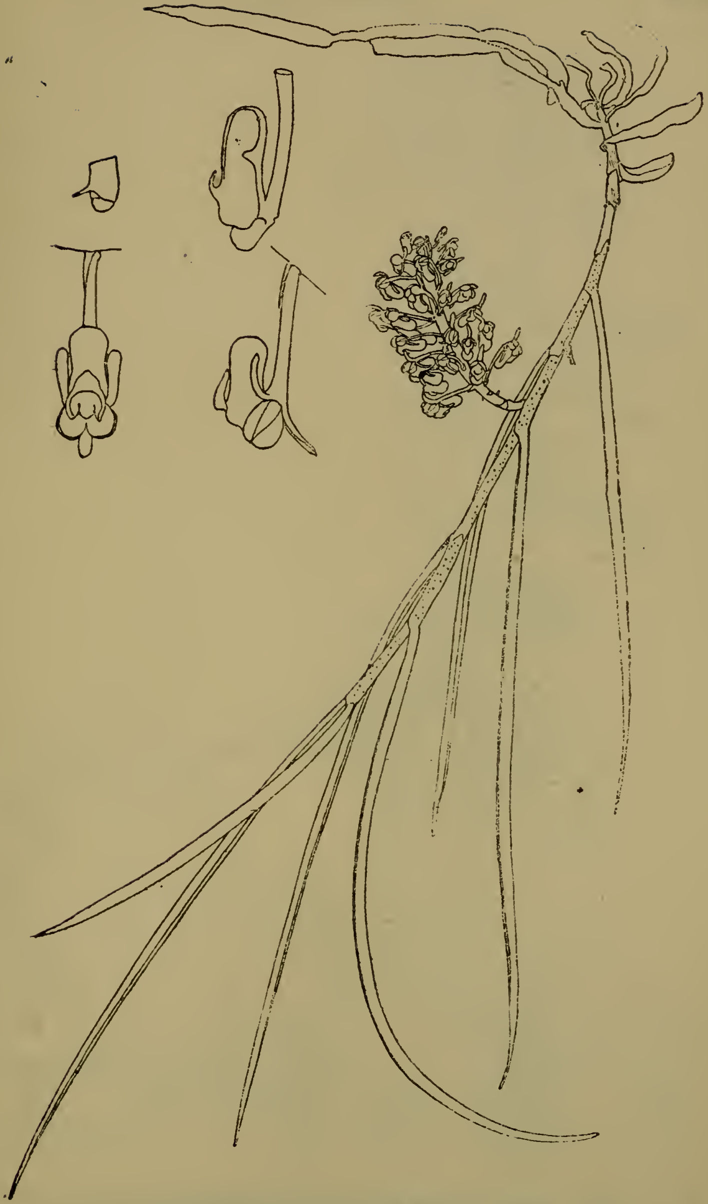
D. R. Fyson del. CALANTHE VERATRIFOLIA *Br.*

15

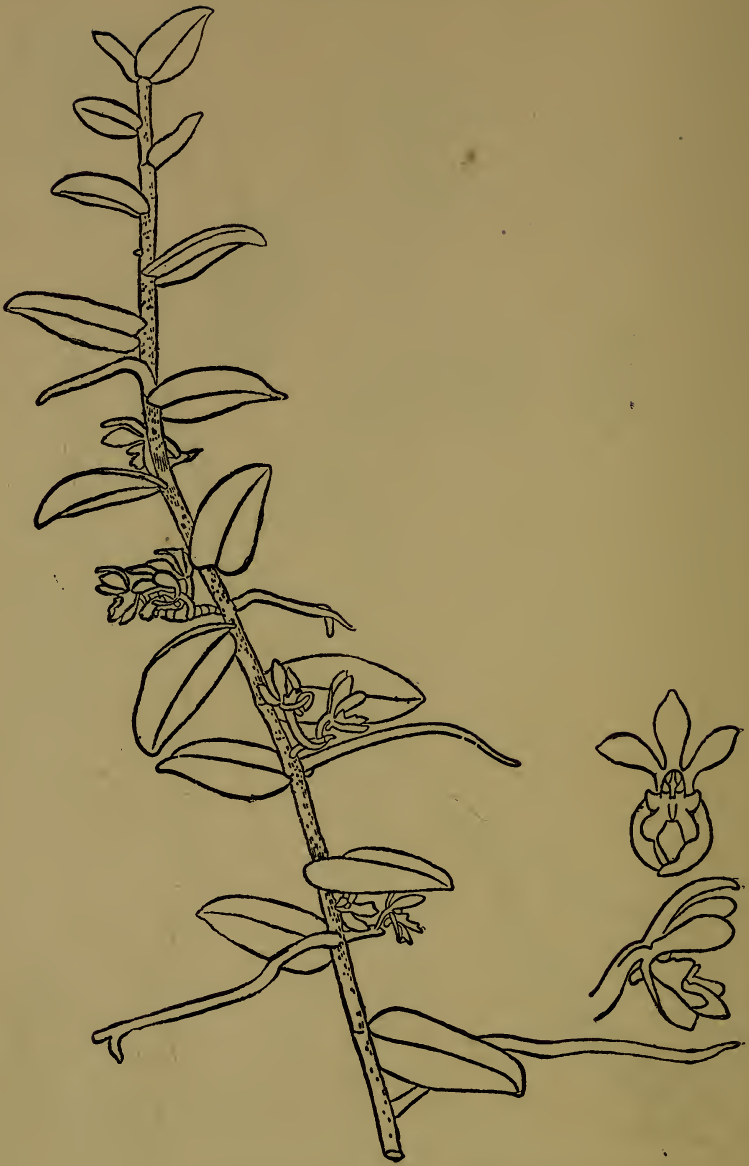
D. R. Fyson del. ARUNDINA BAMBUSIFOLIA *Lindl.*

D. R. Fyson del. EULOPHIA PRATENSIS *Lindl.*

D. R. Fyson del. EULOPHIA NUDA *Lindl.*

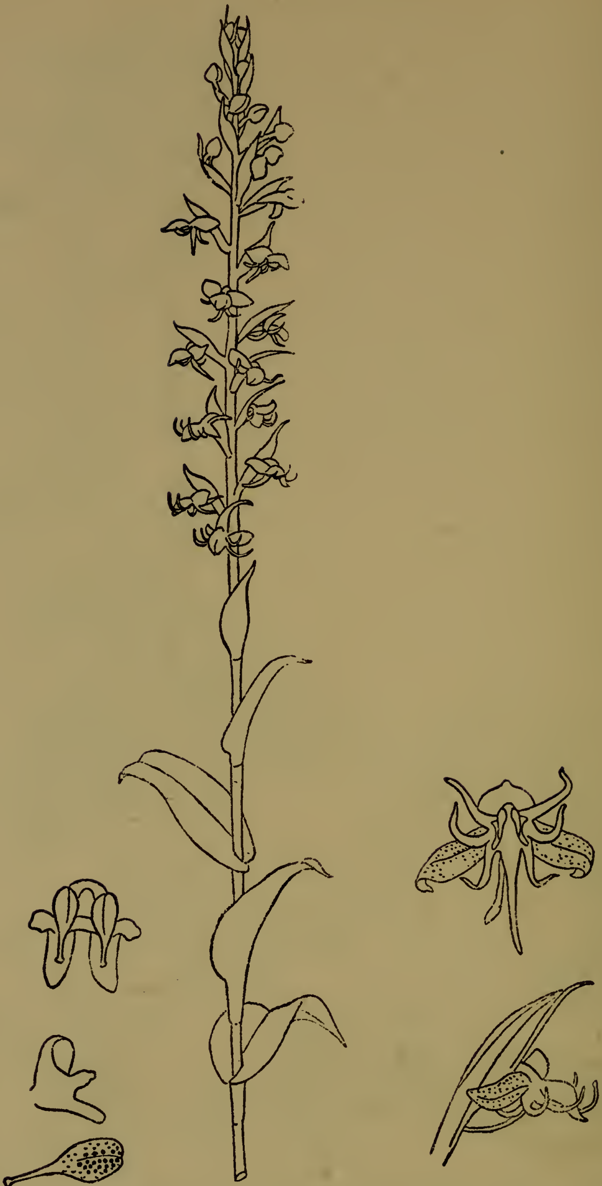


SACCOLABIUM FILIFORME *Lindl.*



D. R. Fyson del. CLEISOSTOMA TENERUM *Hook. f.*

D. R. Fyson del. CHEIROSTYLIS FLABELLATA *Wt.*



D. R. Fyson del. HABENARIA TRAVANCORICA *Hook. f.*

D. R. Fyson del. HABENARIA RARIFLORA *A. Rich*

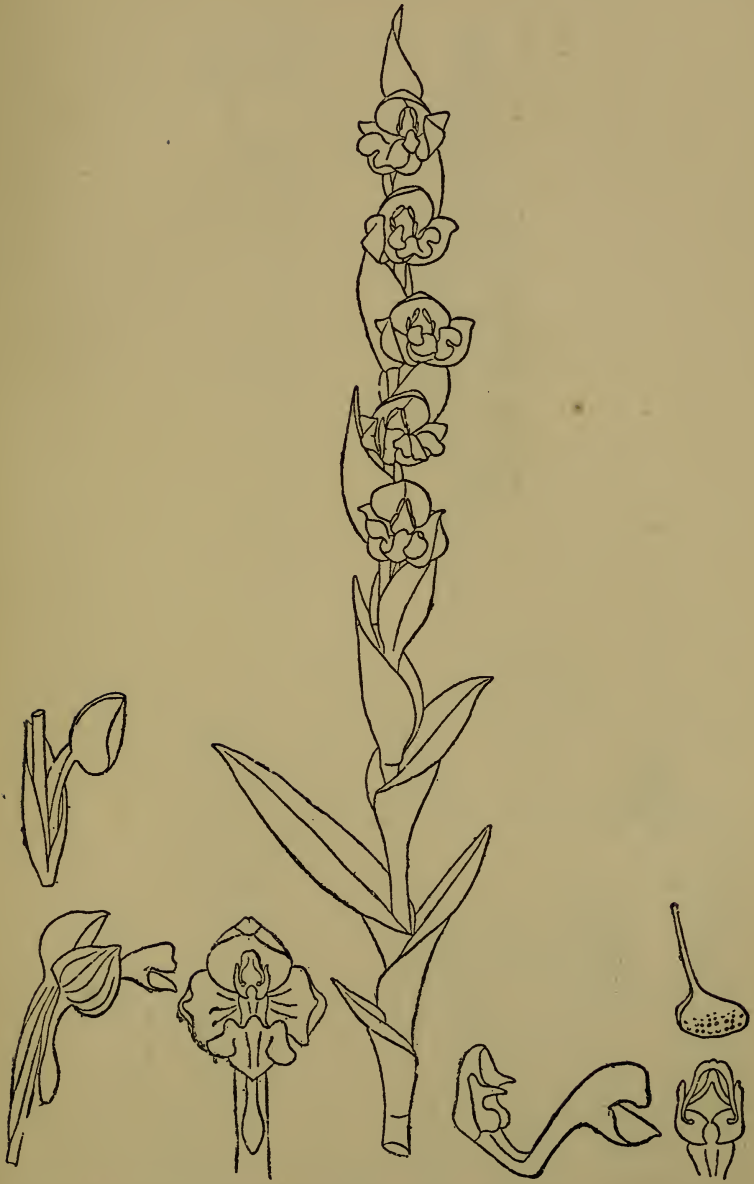
D. R. Fyson. HABENARIA SUSANNÆ *Br.*

D. R. Fyson del. HABENARIA LONGICORNU *Lindl.*

D. R. Fyson del. HABENARIA ELLIPTICA *Wt.*

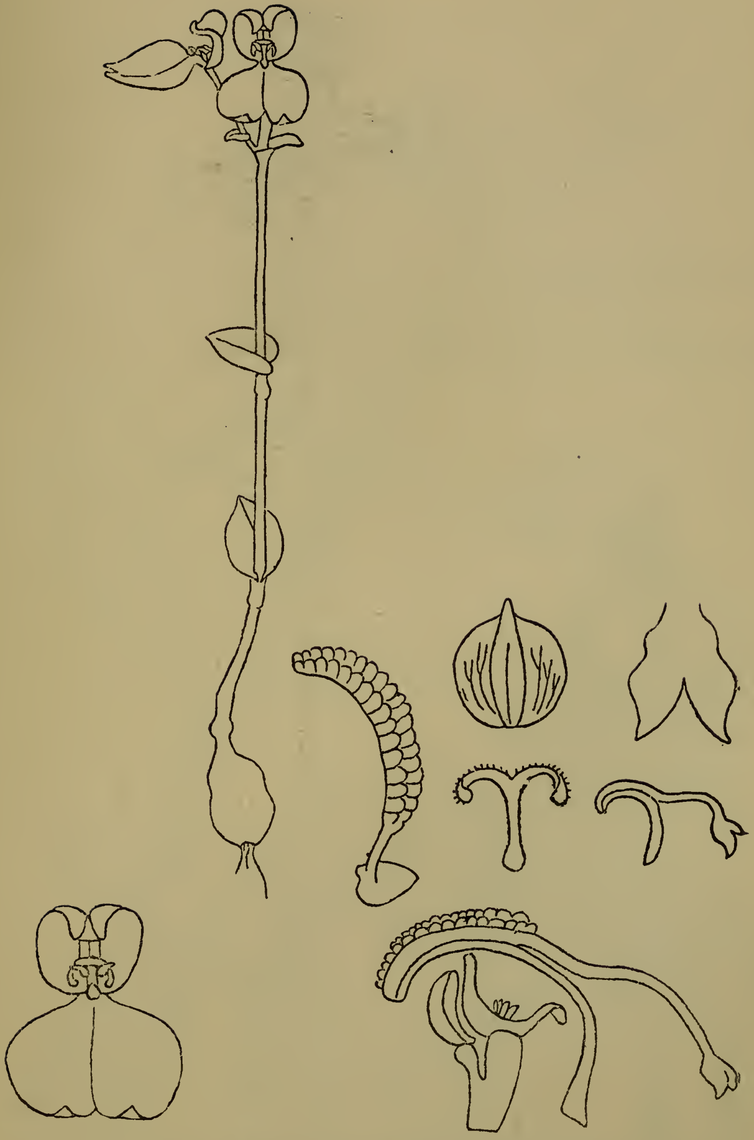
D. R. Fyson del. HABENARIA HEYNEANA *Lindl.*

D. R. Fyson del. HABENARIA ARISTATA *Hook. f.*



D. R. Fyson del. HABENARIA PERROTTETIANA *A. Rich.*

D. R. Fyson del. SATYRIUM NEPALENSE *Don.*

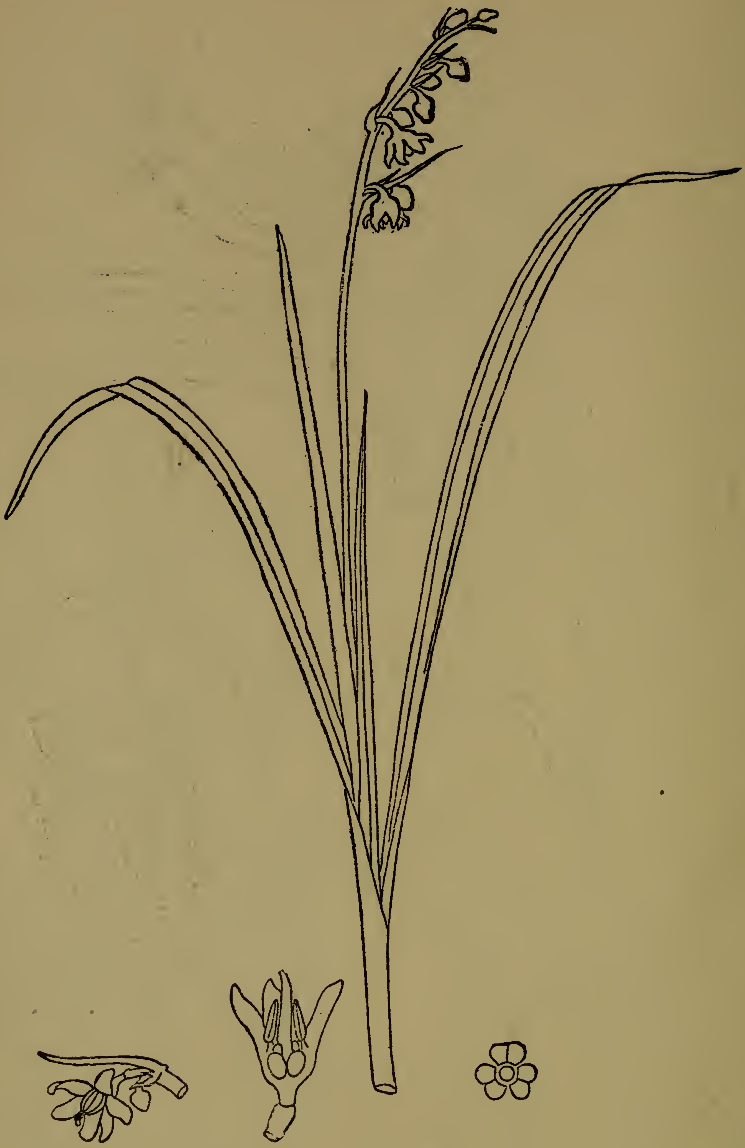


D. R. Fyson del. DISPERIS ZEYLANICA *Trimen.*

16

D. R. Fyson del. DISPERIS NEILGHERRENSIS *Wt.*

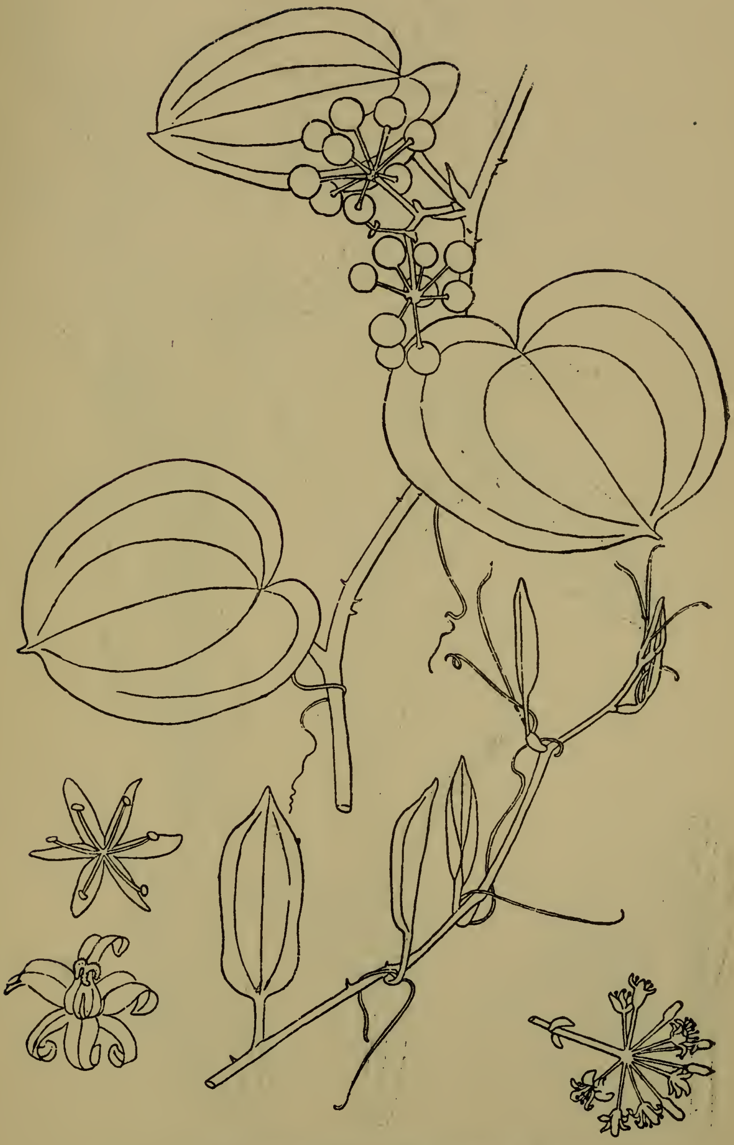
D. R. Fyson del. HEDYCHIUM CHRYSOLEUCUM *Hook.*



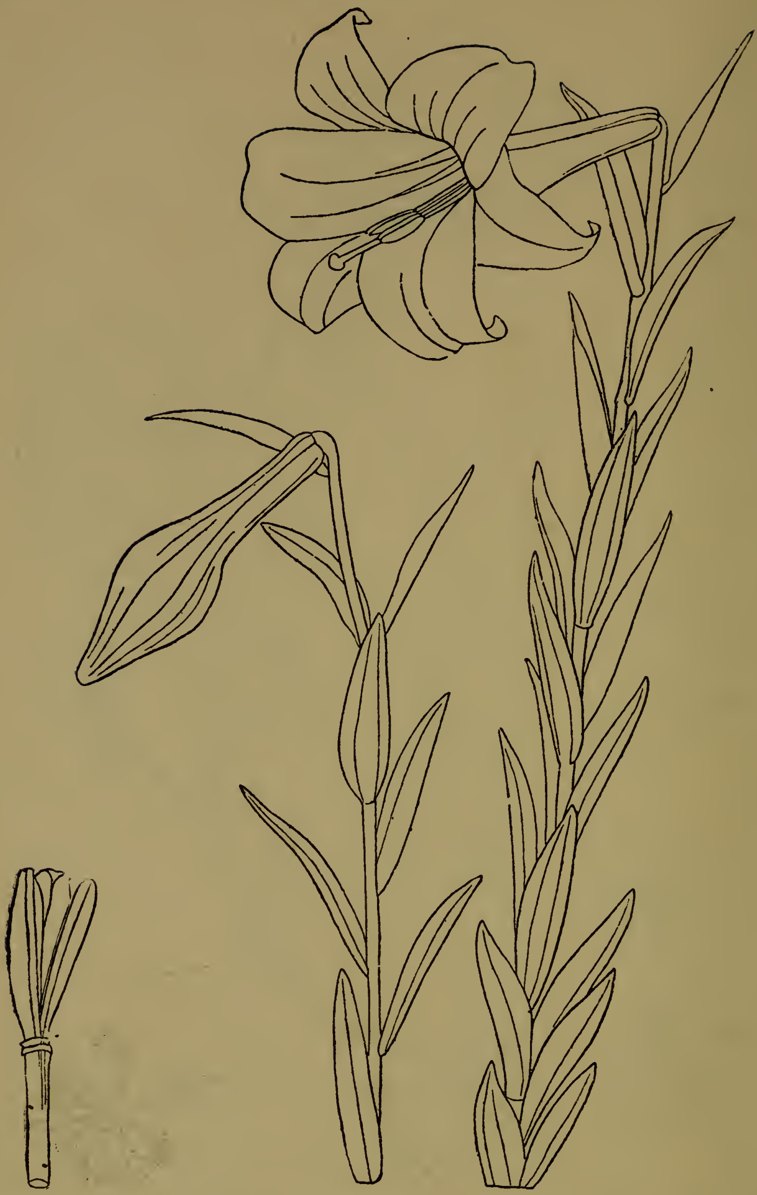
D. R. Fyson del. OPHIOPOGON INTERMEDIUS *Don.*

D. R. Fyson del. HYPOXIS AUREA Lour.

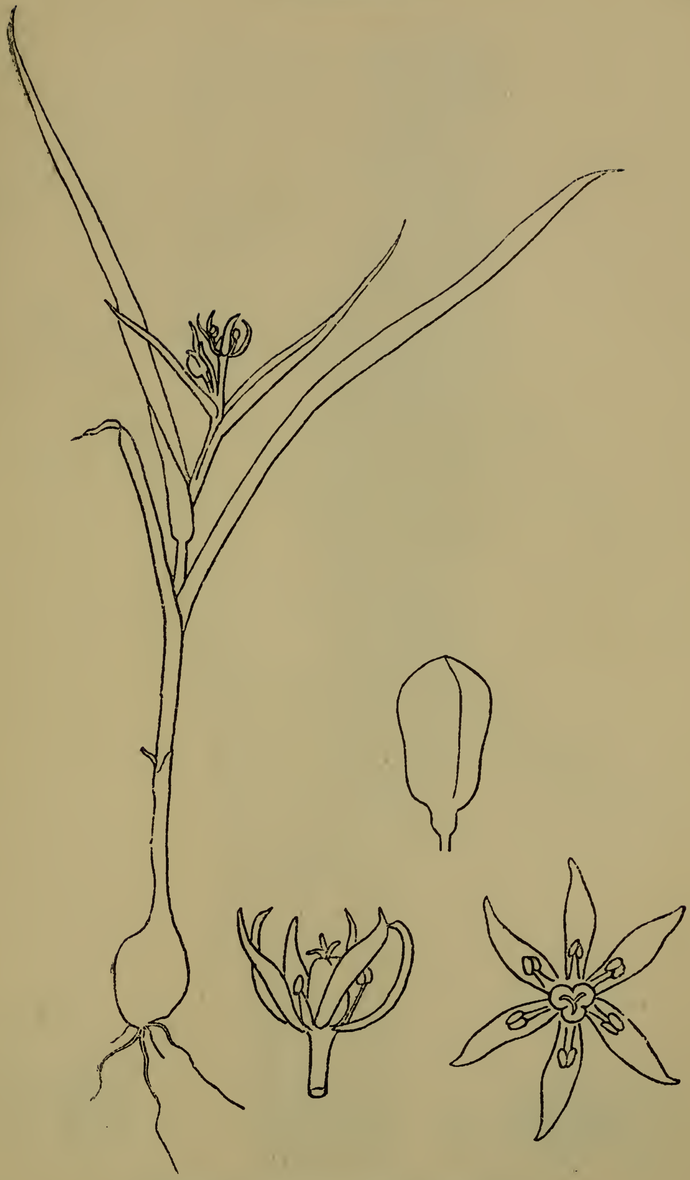
D. R. Fyson del. ZEPHYRANTHES CARINATA *Herb.*



SMILAX WIGHTII *A. DC.*



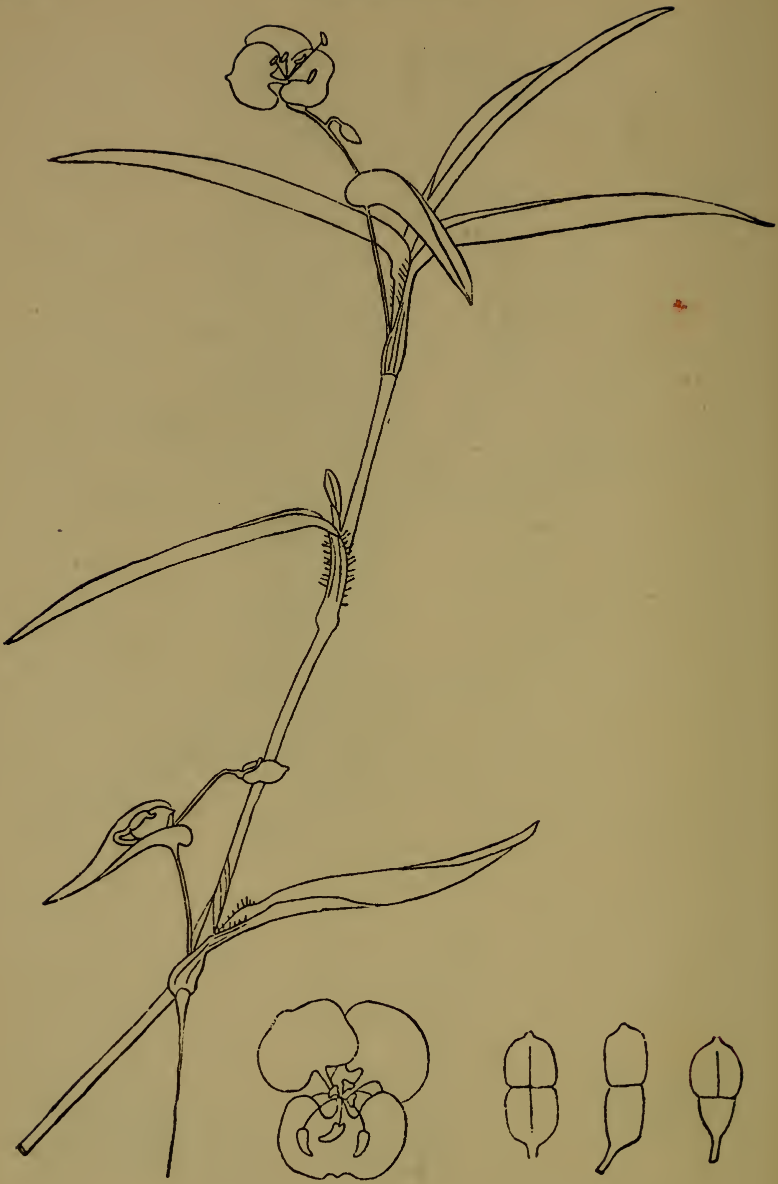
D. R. Fyson del. LILIUM NEILGHERRENSE *Wight.*



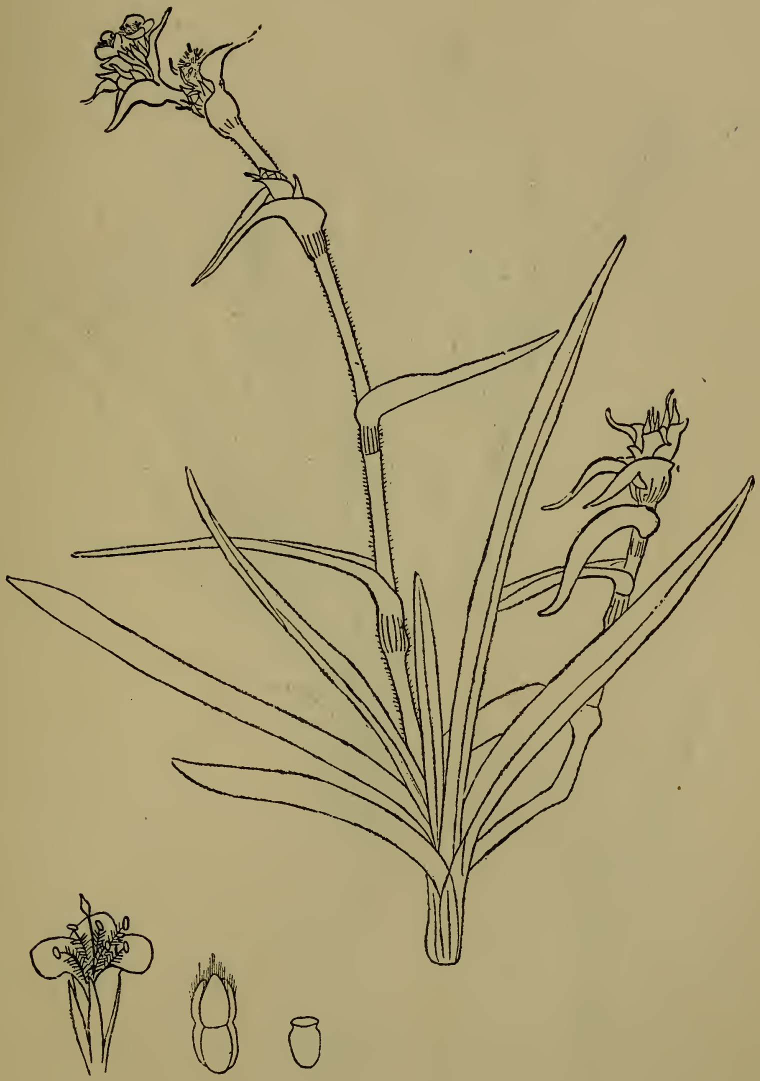
IPHIGENIA INDICA *Kunth.*

EUCOMIS UNDULATA *Willd.*

COMMELINA HIRSUTA *Clarke.*



COMMELINA CLAVATA *Clarke.*

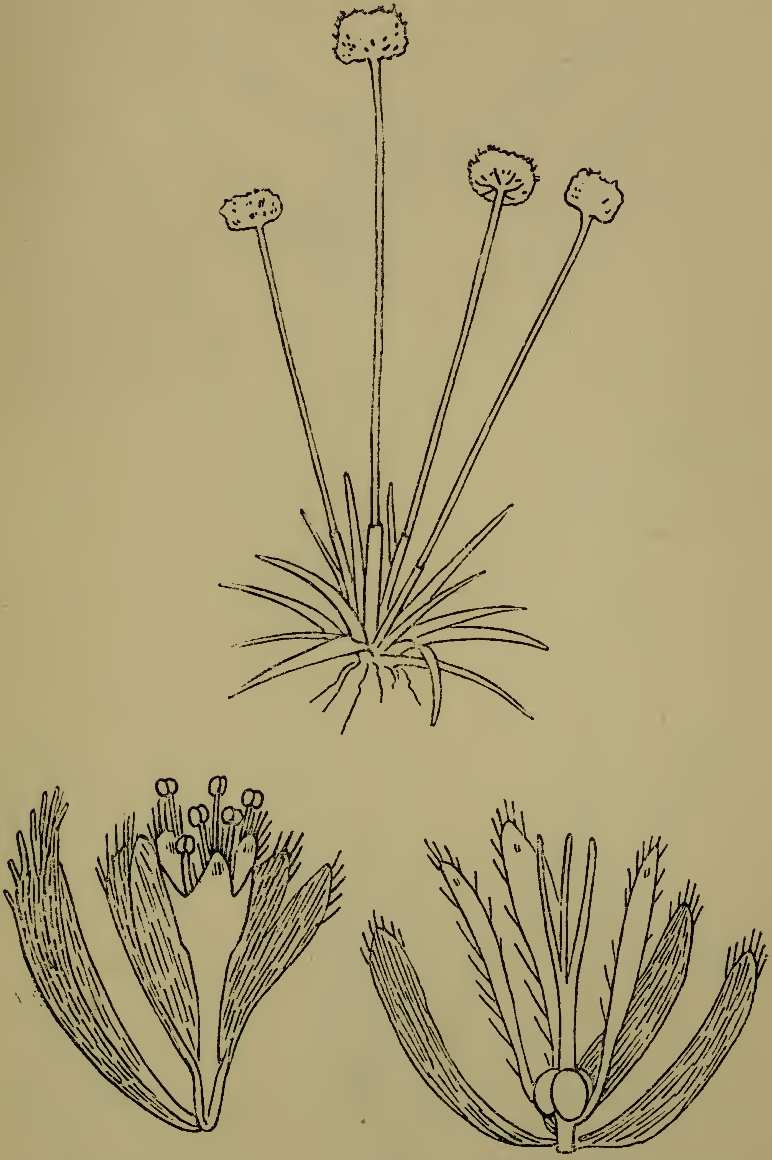


D. R. Fyson del. CYANOTIS WIGHTII *Clarke.*

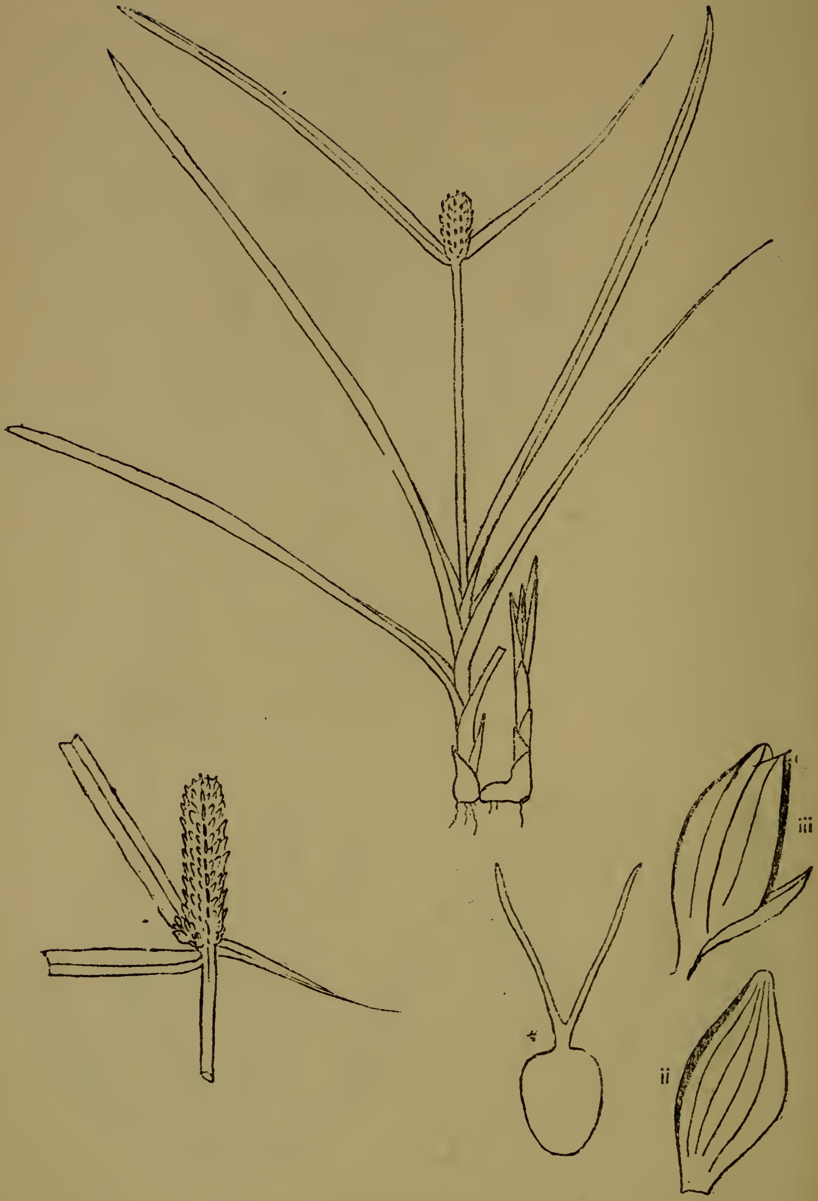
JUNCUS BUFONIUS *L.*

JUNCUS GLAUCUS *Ehrh.*

LUZULA CAMPESTRIS *DC.*



D. R. Fyson del. ERIOCAULON HORSELY-KUNDÆ *Fyson.*
Var. MEGALOCEPHALA.



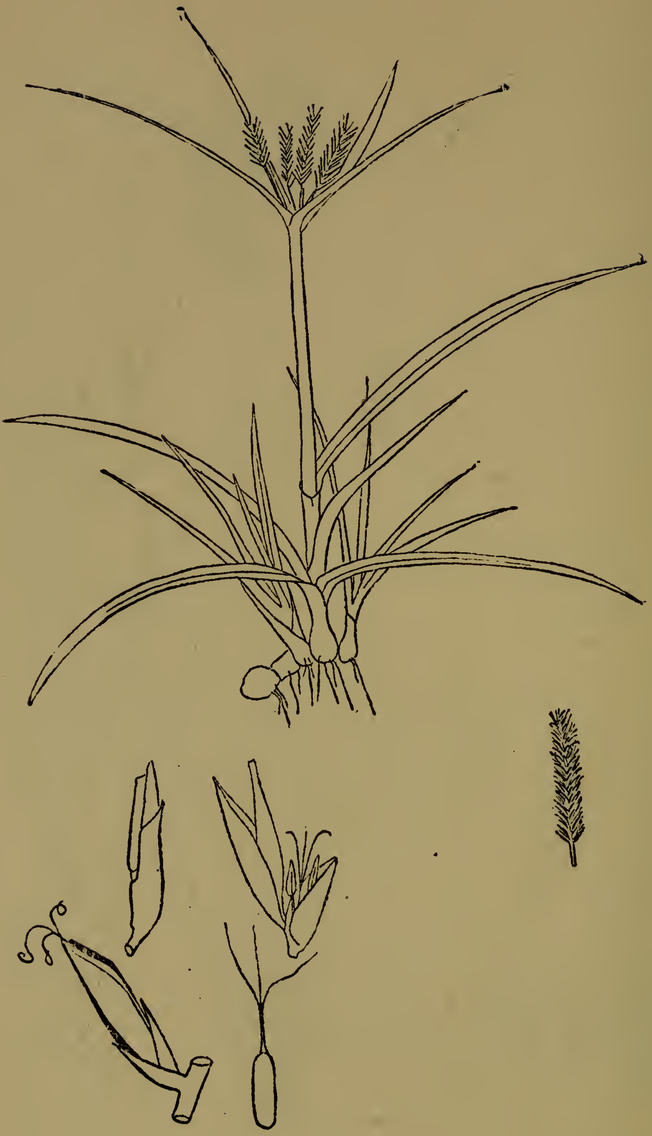
P. F. Fyson del. KYLLINGA CYLINDRICA *Nees.*

P. F. Fyson del. CYPERUS ANGULATUS *Nees.*

P. F. Fyson del. CYPERUS DIGITATUS *Roxb.*

P. F. Fyson del.

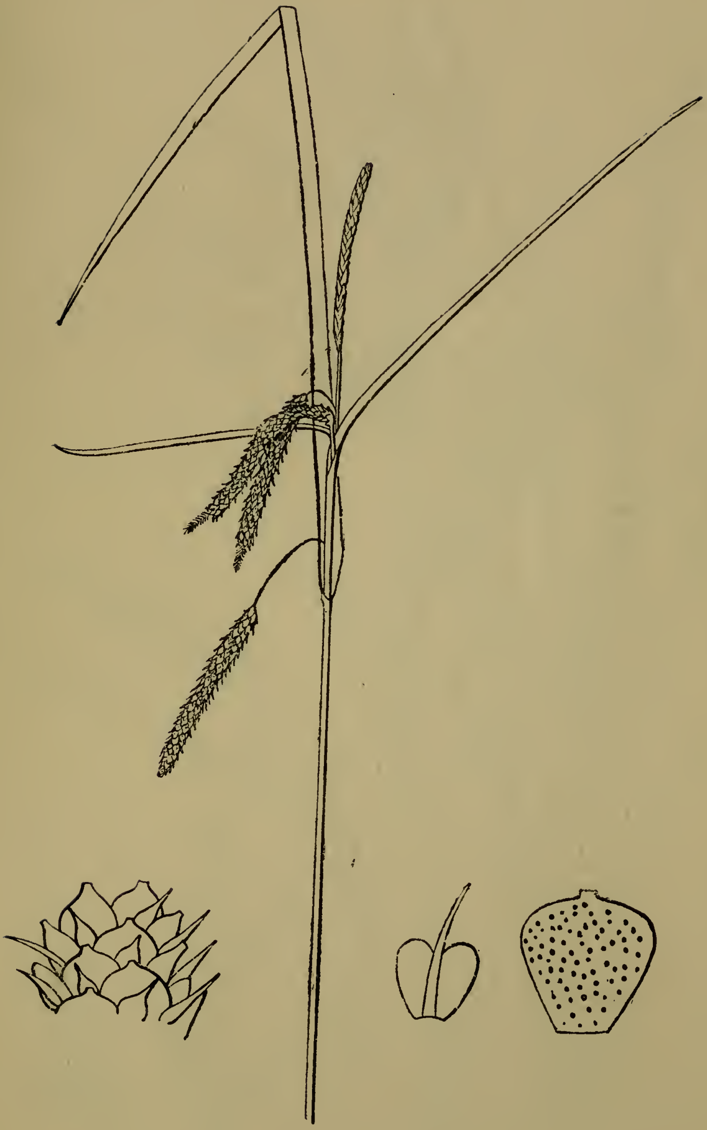
CYPERUS GLOBOSUS *All.*
Var. NILAGIRICUS.



P. F. Fyson del. MARISCUS CYPERINUS *Vahl.*

P. F. Fyson del. SCIRPUS MUCRONATUS *L.*

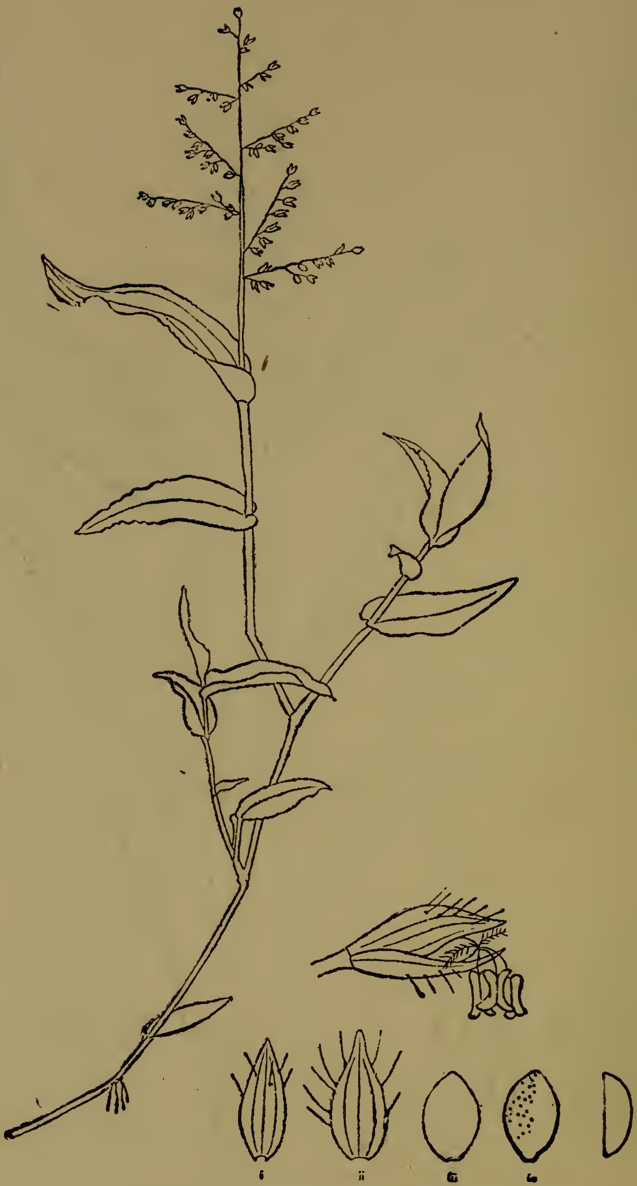
P. F. Fyson del. SCIRPUS SUBCAPITATUS *Thw.*



P. F. Fyson. CAREX PHACOTA *Spreng.*

P. F. Fyson del. CAREX FILICINA *Nees.*

P. F. Fyson. CAREX MYOSURUS *Nees.*

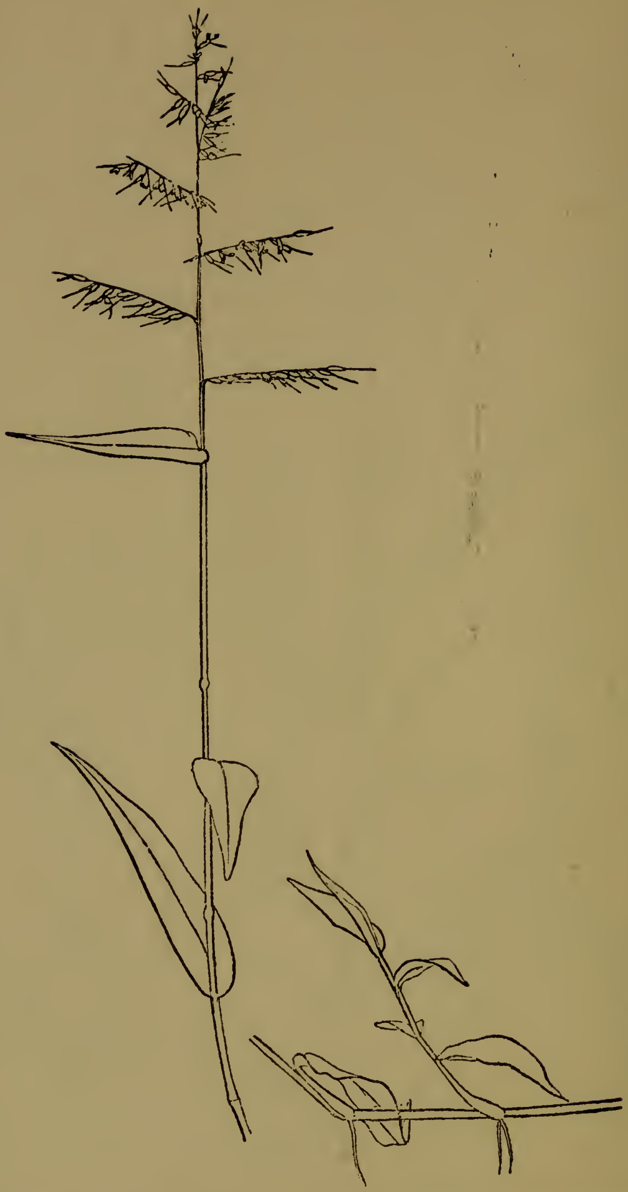


P. F. Fyson. ISACHNE KUNTHIANA *W. & A.*

P. F. Fyson del. ISACHNE AUSTRALIS *Br.*

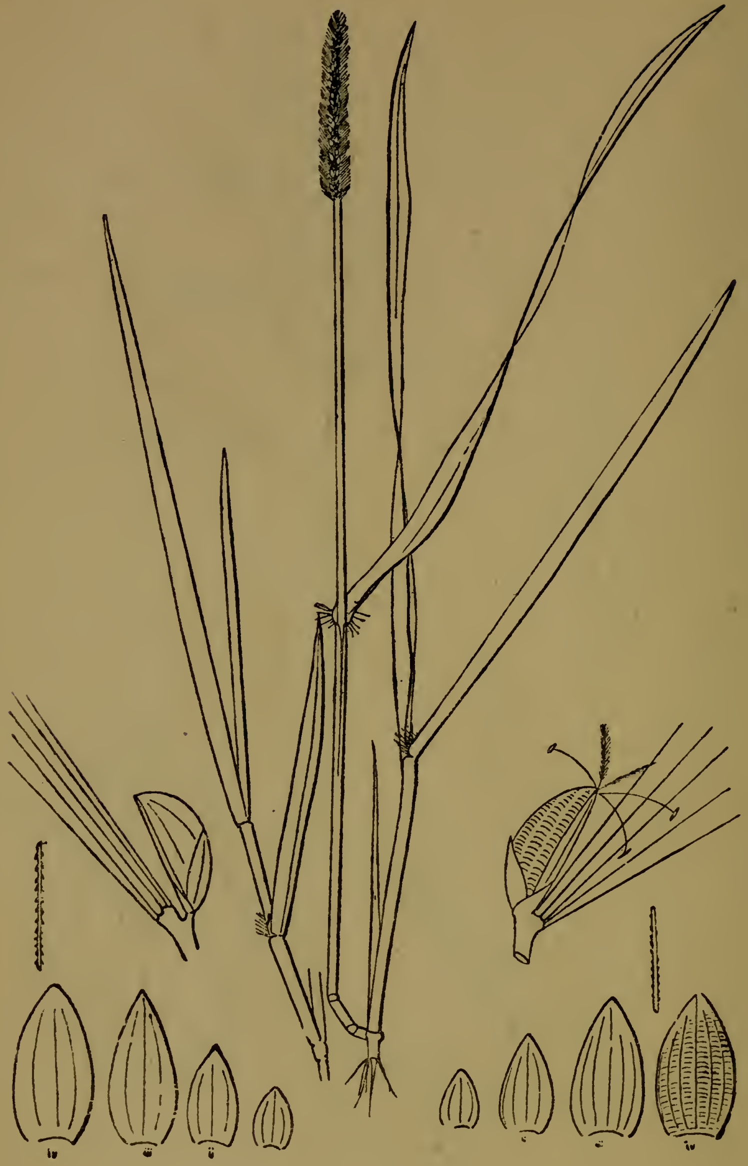
P. F. Fyson del. ISACHNE GARDNERI *Benth.*

P. F. Fyson del. PANICUM VILLOSUM *Lamk.*



P. F. Fyson del. OPLISMENUS UNDULATIFOLIUS *Beauv.*

P. F. Fyson. ARUNDINELLA FUSCATA *Nees.*
18

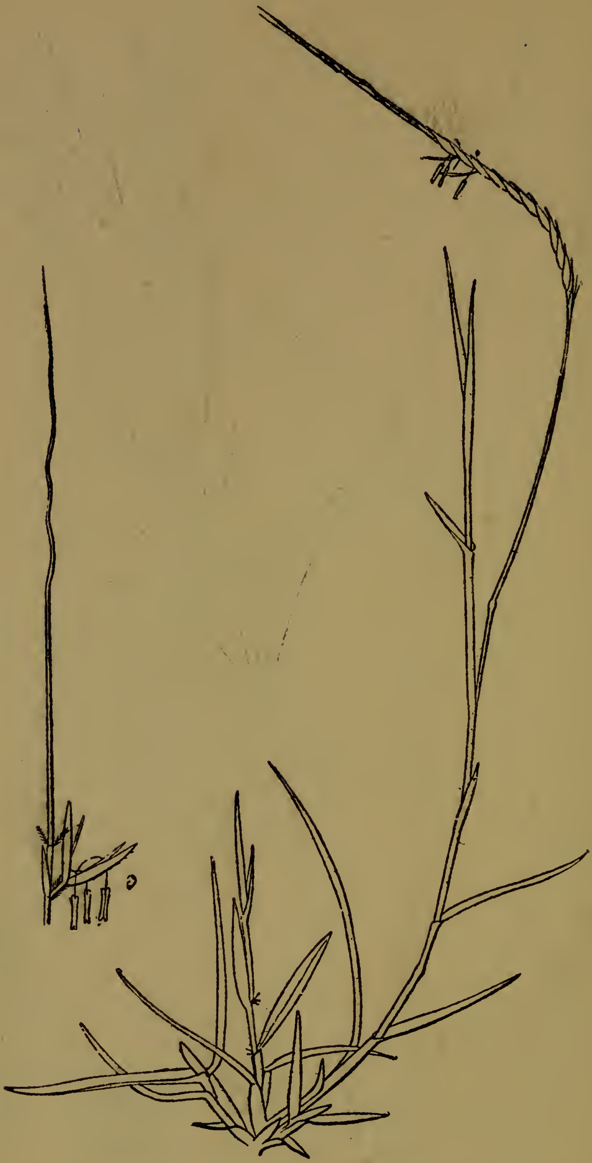


P. F. Fyson del. SETARIA GLAUCA *Beauv.*

P. F. Fyson. POLLINIA QUADRINERVIS *Hack.*

P. F. Fyson del. ISCHÆMUM CILIARE *Retz.*

P. F. Fyson del. CHRYSOPOGON ZEYLANICUS *Thw.*

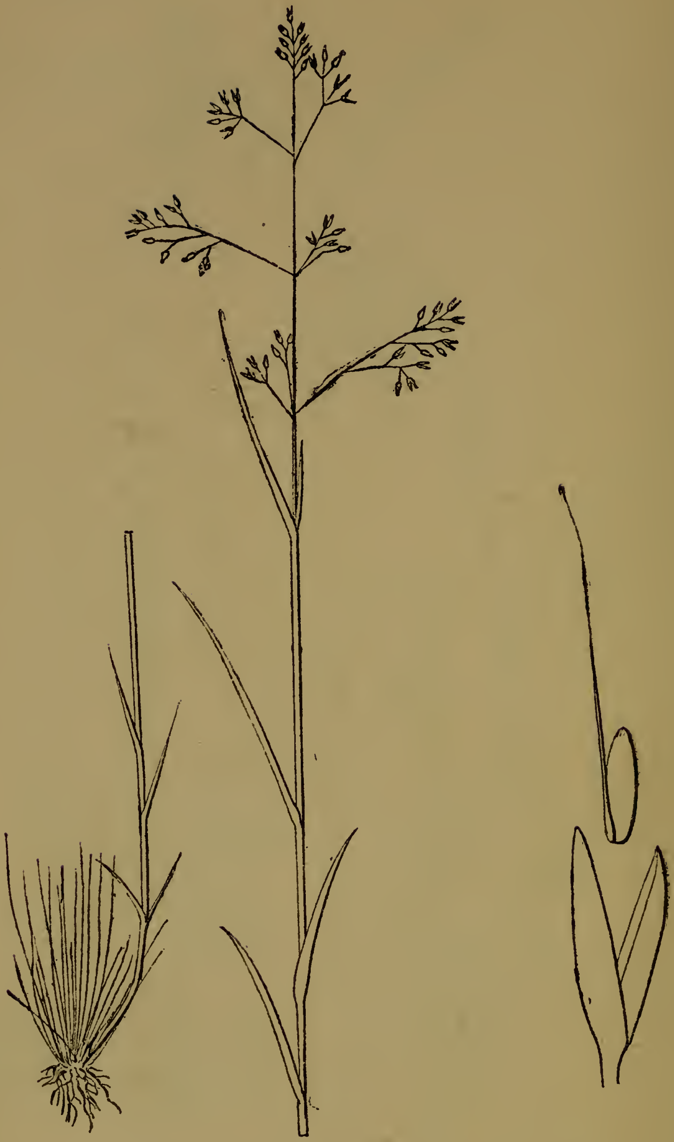


P. F. Fyson del. HETEROPOGON CONTORTUS *Beauv.*

P. F. Fyson del. CYMBOPOGON POLYNEUROS *Stapf.*

P. F. Fyson del. CYMBOPOGON LIVIDUS *Stapf.*

P. F. Fyson del. ANTHISTIRIA CILIATA *L.*



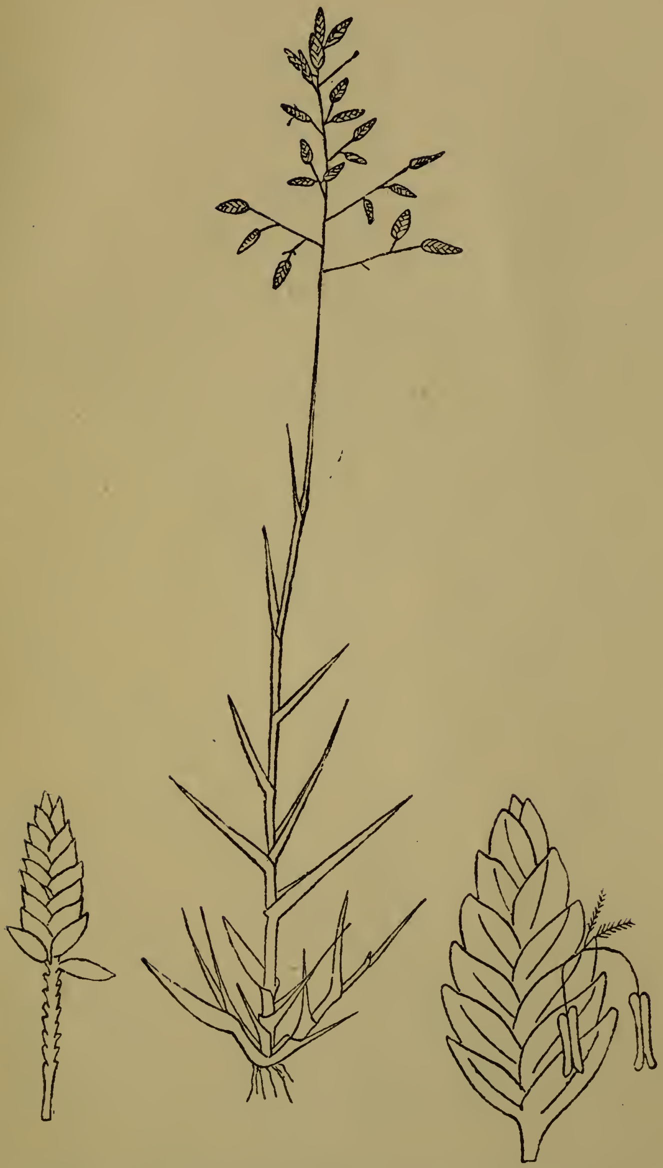
P. F. Fyson del. CALAMOGROSTIS PILOSULA *Hook. f.*

P. F. Fyson del. ZENKERIA ELGANS *Trin.*

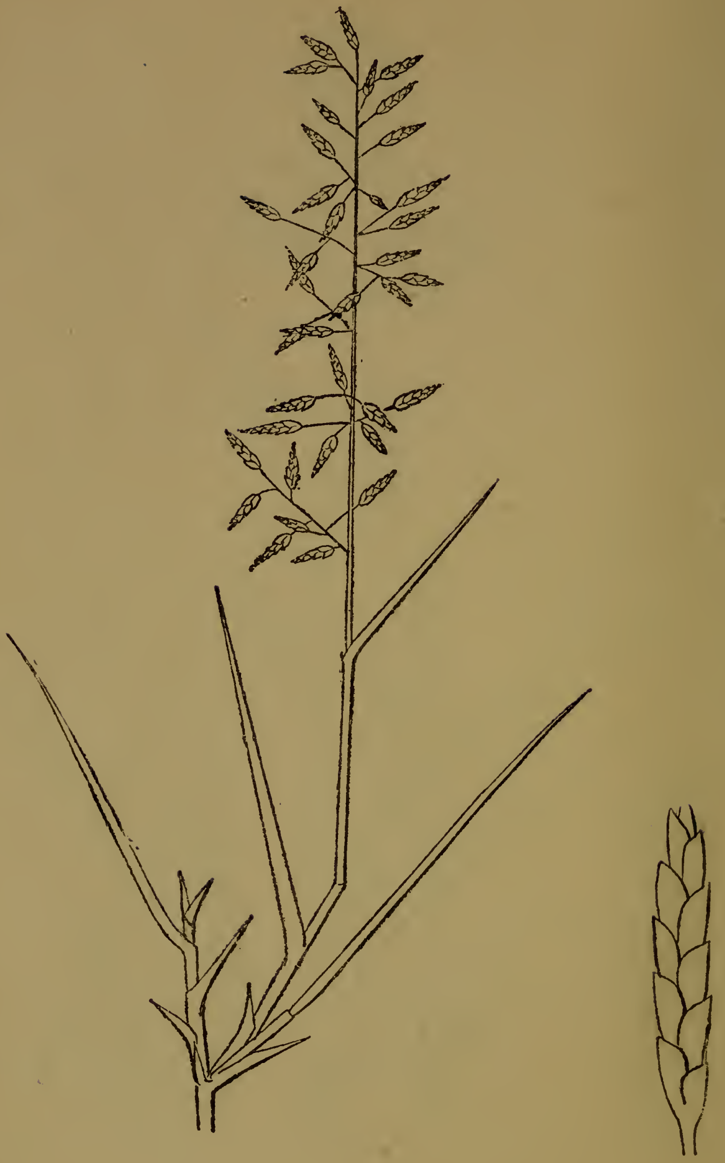
CŒLACHNE PULCHELLA *Br.*

P. F. Fyson del. TRIPOGON BROMOIDES *Roth.*
Var. MAJOR *Stapf.*

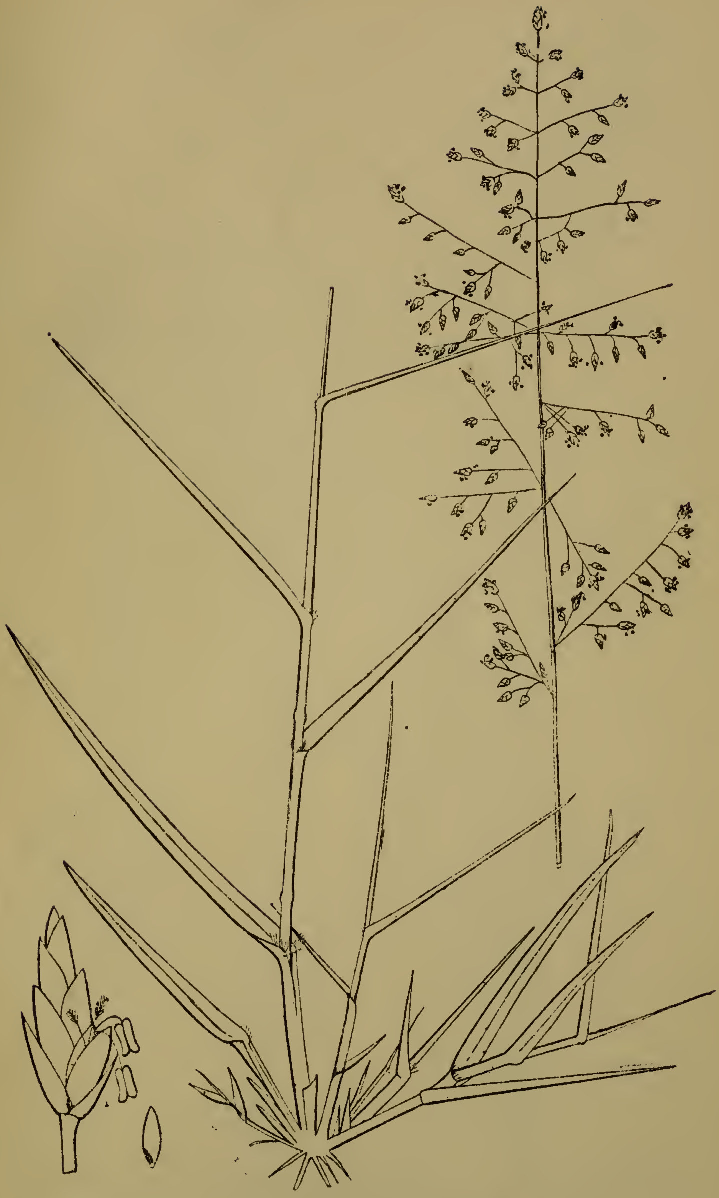
ERAGROSTIS AMABILIS *W. & A.*



P. F. Fyson del. ERAGROSTIS WILLDENOVIANA *Nees.*



P. F. Fyson del. ERAGROSTIS TENUIFOLIA *Hook. f.*



P. F. Fyson del. ERAGROSTIS NIGRA *Nees.*

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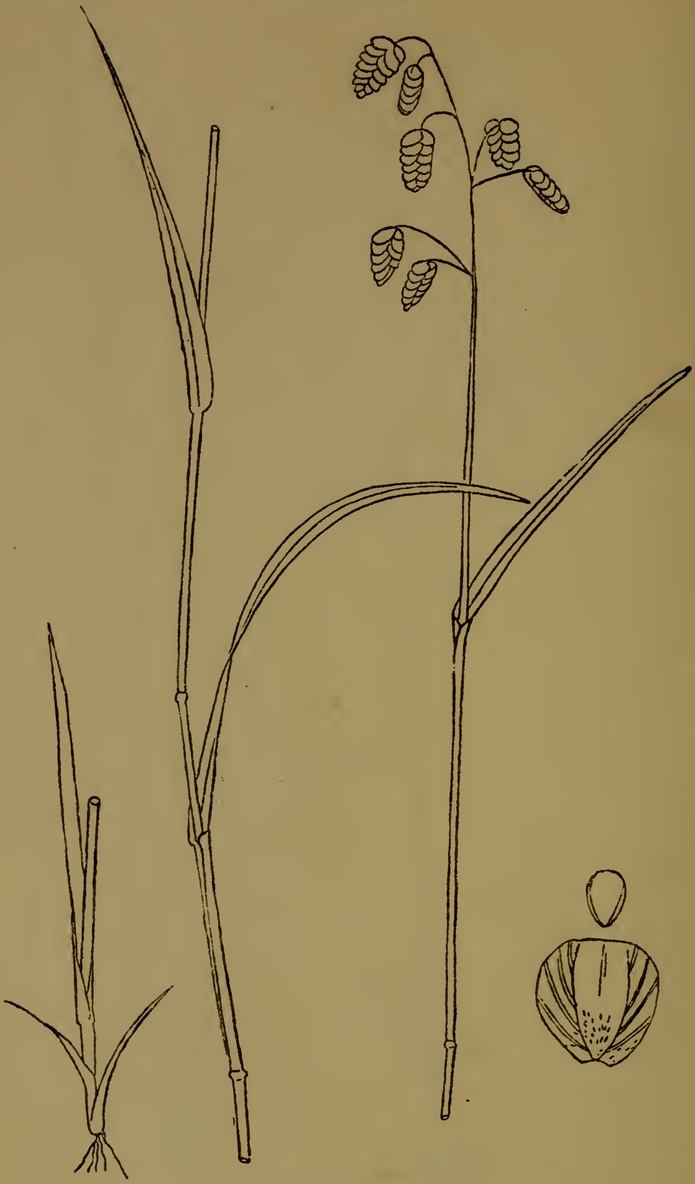
P. F. Fyson del. BRIZA MEDIA *L.*

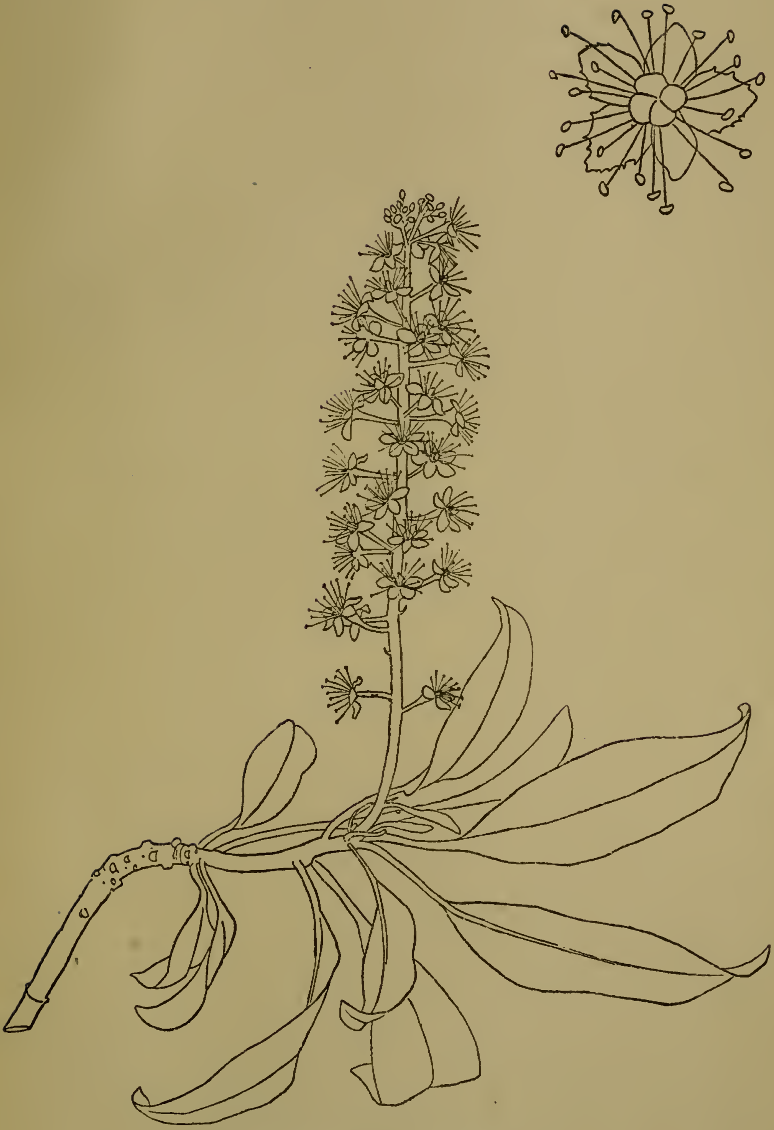
P. F. Fyson del. BRIZA MAJOR *L.*



BRIZA MAJOR *L.*

POA ANNUA *L*

P. F. Fyson del. FESTUCA BROMOIDES *L.*



PHYTOLACCA DIOICA *L.*

AUTHOR'S POSTSCRIPT.

The later stages of this work had to be done during a period of illness, and in addition unrest in the press delayed matters and many of the plates and part of the manuscript were not even in first proof before I left India on the necessary furlough. Rao Bahadur K. Ranga Achariyar, whose botanical work is well known in South India, very kindly agreed to see the rest of it through the press, but modestly cut out my reference and thanks from the preface. But the year 1920 was a difficult one in the printing line, and I regret to say that a number of mistakes and misprints occur in the book. I give below the more important.

Introductory Part.

In the note on Botanical nomenclature, at the bottom right hand corner, the words *one genus* should read *our species.*

The Key to the Families has been printed in the unfinished state in which I had perforce to leave it. But few references are given to the page in this volume, and in many cases the reference is to the page in volume I without being so indicated. Thus all page references in bracket 2 are to Vol. I. So also in bracket 7, in bracket 25 Polygonaceæ, brackets 26 and 27 Drosera, bracket 34 Ammannia (which should now read Rotala) and in most of the remaining brackets. The following corrections should also be made:—

In bracket 3, at end of first line (sedges, etc.) *read* 74

"	3,	*for*	60	*read*	64.
"	4	"	54	"	57.
"	5	"	34	"	37.
"	...	"	61	"	65.

In bracket 7, *for* 28 *read* 33.
„ 8 „ 16 „ 24.
„ „ „ 29 „ 30.
„ 38 „ 41 „ 39.
„ 65 „ 62 „ 66.

Include the first line of bracket 3 in 22, and *delete* second line of 23.

Add after bracket 65 :—

66 { Anther one only, large; style passing between its lobes: ovary inferior . . . . . . *p.* 114. SCITAMINEÆ, and Vol. I, p. 407. ZINGIBERACEÆ.
Slender twining plant with ovate or peltate leaves: fruits, crescent-shaped . . . . *p.* 2. MENISPERMACEÆ.
Stamens three, six, nine or twelve. Trees, shrubs and herbs 67

67 { Anthers opening by lateral holes, covered by flaps: stamens six to twelve 68
Anthers opening by slits: stamens three to six . . . 69

68 { Flowers in open racemes: fruit juicy: all stamens fertile . . . . Vol. I, *p.* 13. BERBERIDACEÆ.
Flowers clustered inside an involucre of bracts: fruit hard: some stamens sterile . . . Vol. I, *p.* 345. LAURINEÆ.

69 { Flowers in cymes or solitary, fruit ½ inch drupe or splitting into one-seeded parts: leaves pinnately veined . . . . *p.* 125. EUPHORBIACEÆ.
Fruit a capsule, or fleshy herbs: leaves absent or veined from the base 70

Monocotyledons with three to six stamens.

70 { Ovary inferior 73
Ovary superior 71

71 { Stem and branches green, needle-like and thorny: flowers white: fruit ¼ inch berry . . . *p.* 116. ASPARAGUS.
Green stem and narrow roundish leaves almost indistinguishable: flowers scarious: fruit dry. Rushes *p.* 118. JUNCACEÆ.
Leaves flat and ribbon-like (Grasses and Sedges) . . 74
Flowers in a small cone on a leafless stem: basal leaves narrow, ribbed: petals three, bright yellow, Vol. I, *p.* 417. XYRIS
Leafy herbs 68

72 Petals three connected at the base, distinct from the sepals : usually blue . . . . *p.* 117. COMMELINACEÆ.
Petals and sepals usually both white, never blue . . . *p.* 115. LILIACEÆ.

73 Small often leafless marsh plant : perianth surrounding, the ovary with three twisted wings . . Vol. I, *p.* 379. BURMANNIA.
Leaves narrow : flowers solitary or umbelled, in the axil of a spathe on a leafless stem . *p.* 114. AMARYLLIDACEÆ.
Leaves narrow : flowers racemed . . *p.* 114. OPHIOPOGON.

74 Stem triangular : sheathing base of leaf not split . . Sedges . . . . *p.* 119. CYPERACEÆ.
Stem roundish : sheath split, a flap or line of hairs at junction between sheath and blade . *p.* 121. GRAMINEÆ.

Errata in the Descriptive part.

Page 65.—Above **Pavetta breviflora** *add*: **Pavetta indica** *Linn.*; similar to the next species, but corolla and style longer. t. 365 (probably).

Gen. Dist. Throughout India.

Page 66.—Under **Psychotria congesta**, after t. 366 *read* fruits to the right only, and t. 368.

Page 66.—Under **P. bisulcata**, *for* t. 368 *read* t. 366 plant and four fruits at left hand bottom corner.

Page 68.—*For* **Vernonia** *sp. nov. read* **Vernonia pulneyensis** *Gamble; Kew Bull.* 1920 *p.* 341.

Page 86.—Under **Datura stramonium** *Linn.*, the reference to t. 439 is incorrect, the figure being of **D. suaveolens** *H.B. & K.*, and upside down.

Page 90.—Under **Bonnaya veronicæfolia** *Spreng.* after t. 446 *add* "upper half of plate only".

Page 92.—Under **Strobilanthes** *add* the following species:—

S. kunthianus, *T. Anders.*; Vol. I p. 312 and II t. 206.
S. cuspidatus, *T. Anders.*; Vol. I p. 312 and II t. 207.
S. sexennis *Nees*; Vol. I p. 314.

Page 93.—Under **S. wightianus** *Nees*, *add* "Vol. I p 313 and II t. 208".

Page 94.—Under **S. sessilis** *Nees, add* Vol. I p. 314 and II t. 209.

Page 97.—Under **Pogostemon wightii** *Benth., delete* words "4,339 (figured)".

Page 99, *line* 2.—*Delete* "t. 464".

Page 109.—*For* "**Dorstenia india**" *read* "**Dorstenia indica**".

Page 119.—Under **Eriocaulon Horsly-kundæ** *Fyson, for* "Records of the Botanical Survey of India" *read* "Journal of Indian Botany, Vol. II (1921)".

Page 121.—Under **Carex filicina** *Nees,* line 5, *for* "formed a" *read* "*forming*".

Page 125, *line* 4 *of the Key of Eragrostis.—For* "Glume i on" *read* "Glume i o or".

Page 128.—Under **Desmodium rotundifolium** *Baker, delete* the word "figured" (the figure has been lost.)

Page 128.—Under **Acrocarpus fraxinifolius** *Wight, delete* the words in the bracket at the end of line 1 (being obviously a direction to the printer) and *for* "a lac" *read* "a tree"; and *for* the second "pinnate" *read* "pinnæ".

Errata in the Illustrations.

304. Name should be to the right

305. *P. F. Fyson del.*

306. Do.

307. Figure is upside down.

315. Name should be to the left.

319. Do. to the right.

320. Do. at the bottom.

333. Figure is upside down.

336. *Gordon Robertson del.*

341. Do.

343. Figure is upside down.

351. Do. or name to the left.

362. *R. Natesan del.*

365. PAVETTA INDICA *Linn.* (probably).

366. Plant, flower and four fruits at left hand bottom corner and the dissections below them are Psychotria bisulcata ; the round fruits are P. congesta.

368. PSYCHOTRIA CONGESTA *W. & A.*, large leafed form.

377. VERNONIA PULNEYENSIS *Gamble.*

419. Name should be to the right.

439. DATURA SUAVEOLENS *H.B. & K.*; *Gordon Robertson del.*; figure is upside down.

445. *Gordon Robertson del.*

446. *Gordon Robertson del.* except dissections which are of another plant.

470. *Gordon Robertson del.*

483. Do.

540. *P. F. Fyson del.*

541. Do.

577. Remove as redundant.

581. Figure is upside down.

Index.

Add "See also index to Vol. I, several genera and popular names being omitted from this index."